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Research Theme:

**Considerations towards the adoption of the Patent Cooperation Treaty (PCT) in Argentina - Learning from the awareness and promotion of the PCT in Japan**

Submitted By  
**Alejandro Javier Cafiero (Argentina)**  
**Universidad Nacional de La Plata (UNLP)**

Supervisor:  
**Dr. Yorimasa Suwa**  
**Senior Researcher, APIC-JIPII**

Advisor:  
**Prof. Junji Nakagawa**  
**Faculty of Liberal Arts, Chuo Gakuin University**

**Mr. Daisuke NAGANO**  
**General Manager/ Patent Attorney**  
**Policy & Strategic, International Affairs Division**  
**Japan Intellectual Property Association**

*The views and findings in this report are those of the author and do not necessarily reflect the views and policy of the organization or sponsor of this study.*

## **Abstract**

The Patent Cooperation Treaty (PCT) is a multilateral treaty of vital importance for the harmonization of the Patent system at the international level. Applicants of countries that have accessed the PCT benefit by having affordable, simpler international filing procedures and speedier preliminary examinations. National Patent Offices are also improved by accessing the Treaty, as they are required to comply with several international standards. 153 countries have accessed the Treaty to date.

Despite the advantages of taking part of the PCT, Argentina has refused to access it, mostly due to a lack of a national IP strategy, misconceptions about the PCT and the op-position of some domestic pharmaceutical companies.

The lack of PCT availability in Argentinian puts domestic applicants at a disadvantage against international counterparts. Such applicants range from universities, research centers and innovative companies to entrepreneurs and inventors.

By examining the experiences of Japanese universities and companies in the PCT system, the present paper aims to contribute to the public debate about the need to access the PCT by Argentina, the advantages of doing so, and how Argentinian applicants could benefit from such instrument.

Japan has an extensive tradition of PCT utilization, as the country was one of the main supporters of the initiative in the 1960s. The majority of PCT applications in Japan are filed by big global companies. However, Universities, SMEs and startups also make use of the system. Currently Japan is the 3° user of PCT worldwide by quantity of applications.

Argentina has much to learn about the Japanese experience in terms of awareness and promotion of the PCT, and how to leverage the PCT in order to foster domestic innovation.

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## **List of abbreviations**

IPO(s) – Industrial Property Office(s).

IPER(s) – International Preliminary Examinations Report(s).

ISR(s) – International Search Report(s).

JIPA – Japan Intellectual Property Association.

JPO – Japan Patent Office.

PCT – Patent Cooperation Treaty.

TLO – Technology Licensing Organization.

WIPO – World Intellectual Property Organization.

WO(s) – Written Opinion(s)

# 1. Introduction

In today's global and interconnected economy, intangible assets play an increasingly important role. As such, patents are the preferred method to protect novel technologies. Inventors, companies, organizations and universities make use of the patent system to protect their inventions, most notably in developed countries such as Japan.

As patents are limited to the jurisdiction of countries, governments seek to streamline and harmonize patent protection worldwide on behalf of their applicants, in order to foster international trade and innovation. It can be argued that two of the most important harmonization efforts related to patents were the Paris Convention (1883) and the Patent Cooperation Treaty (PCT, in force since 1978).

The PCT was mainly developed to help the Patent Offices cope with the increasing number of patent applications being filed at the time. The Offices were doing redundant work, as every time a patent was received from abroad, each Office had to conduct an independent prior art search all over again.

They realized that, by being able to share the prior art search conducted by the first office, the work of the succeeding offices would decrease. In a way, the PCT was developed to cope with the results of increasing globalization of trade and technology.

The needs of applicants were also taken into account in the development of the PCT. The system provides affordable and simpler international filing procedures, and speedier preliminary examinations. For instance, the patent filing via the PCT can be conducted in one language in one Patent Office, and receives only one formal examination.

Advantages of becoming a contracting state of the PCT explain why 153 countries have already accessed the Treaty, including all of Europe, Japan, United States and Brazil (1978), South Korea (1984), China (1994), India (1998), Chile and Peru (2009), among many others.

Taking into account the benefits of becoming a contracting state, and the overwhelming number of countries which have already accessed the Treaty, the question remains: "Why is Argentina not part of the PCT?"

A little-known fact is that Argentina was involved in the development of the PCT. Argentinian authorities, such as the Ambassador to the United States at the time, took part of the negotiations and meetings during the Washington Diplomatic Conference of 1970. The country was among the first 20 nations that signed the Final Act of the PCT.

Later on, in 1998, there was an attempt to join the PCT by Argentinian legislators. The proposal was approved by the Chamber of Senators, but it didn't pass the voting in the Chamber of Deputies.

The debate about accessing the PCT stalled until recently, when the PCT returned to the public agenda linked to the proposed Trade Agreement between Mercosur and the European Union (EU).

There are three main reasons that explain why Argentina has not yet accessed the PCT: a lack of a national IP strategy, misconceptions about the Treaty and the opposition of some domestic pharmaceutical companies.

These companies, mainly represented by the Industrial Chamber of Argentine Pharmaceutical Laboratories (in Spanish, CILFA), have argued that joining the Treaty will be harmful for their industry, the jobs they provide and the public access to medicines.

Among other issues, they claim that global pharmaceutical companies from abroad will be able to file for patents in Argentina in greater numbers, stifling domestic business and competition. They mention that PCT “only serves the main developed countries” and that adopting the PCT will mean losing “legislative sovereignty” and independence.

In order to contribute to the ongoing debate about the PCT, the present paper aims to analyze the experience in the PCT system of Japanese applicants such as Universities and private companies. The analysis aims to provide information on the positive and negative aspects of the PCT, should Argentina decide to access it.

Additionally, the information gathered on PCT utilization by Japanese applicants will allow suggesting counterarguments to the claims of the domestic pharmaceuticals which oppose accessing the PCT.



Japan has been one of the main supporters of the PCT, and the country has been a contracting state since 1978. For the year 2018, Japan was the 3<sup>rd</sup> user of PCT worldwide, with 48,630 applications.

By analyzing PCT utilization by Japanese applicants, the case will be made that it is indispensable for Argentina to access the Treaty, provided some extra measures are taken. The measures include implementing an IP development strategy and actions to support domestic pharmaceutical companies, both generic and innovative.

As some international experiences show, accessing the PCT could be advantageous for domestic applicants, especially for Universities. These organizations are utilizing the PCT system for protection of their research results in multiple countries, for developing joint ventures and international collaboration, among other activities.

In summary, the objectives of the present work are:

1. Provide an overview as to why Argentina is not part of the Patent Cooperation Treaty (PCT) and the implications of such decision.
2. Analyze the experience of Japanese universities and companies regarding three main topics:
  - a. PCT system utilization and the merits of the Treaty.
  - b. The PCT as a source of Patent Information
  - c. PCT awareness and promotion.
3. Offer recommendations to the National University of La Plata (UNLP) and the Patent Office of Argentina (INPI).

Having learned from the Japanese experience, the goal is to contribute to the development of a national IP strategy, to clarify prevalent misconceptions about the PCT, to raise awareness about the necessity of accessing the Treaty by Argentina, and promote the utilization of the PCT among domestic applicants.

## 2. Basic Information and previous studies

### 2.1 The patent system, innovation and development

Academics do not agree in a verified, unquestionable link between the patent system and development. There is no consensus whether improving the patent system is a guaranteed method to provide economic progress in a given country.

However, there are studies that focus on some aspects of the link between the patent system and its impact on development. The reports highlight the fact that there is no “one size fits all” approach, and that the patent system should foster innovation and development taking into account the specific situation and stage of development of the country.

For instance, a report by the WIPO Standing Committee on Patent Law (WIPO 2008, SCP/12/3 Rev., pg. 4), argued that:

*It is generally recognized that the patent system should be viewed in the context of national economic and development policies and strategies in order to truly empower the patent system as a tool for technological development and economic growth. While the patent law provides the legal framework, a number of other features need to be in place, including human resource development, education and effective and efficient administration, and judicial systems.*

Such “national economic and development policies” regarding the patent system follow successive stages that should allow an underdeveloped country to grow through innovation and technology development efforts.

When the country is underdeveloped, it imports technology from most advanced countries, being dependent on such technology providers. Within a lax legal framework, the importing country has leeway to incorporate such technologies and begin improving upon them.

Following the “imitation stage”, which includes domestic capacity building and technology absorption, the developing country begins to develop its own original technology. The process is often referred to as “catching up”. Later on, in order to protect domestic innovation, both inside the country and abroad, the legal framework is strengthened.

Prime examples of such successive stages are Japan, US, China and South Korea. In their own time, they transitioned from having lax IP systems, and then strengthened those systems when domestic innovation and technology were in a mature stage.

Specifically in the case of Japan, authors Odagiri and Goto (1996, pg. 38) argued that development through “technology importation” after the Word War II happened in six ways: (1) imported machinery from the US and Europe helped increase product quality and productivity, (2) Japanese firms sought technological agreements with foreign companies, (3) Japanese companies hired consultants from abroad, (4) by purchasing blueprints and inventions, (5) by sending to engineers to study abroad and (6) by the restriction of foreign direct investment until gradual liberalization.

Odagiri and Goto further explained why Japan utilized these means of technology importation more actively and effectively:

*(...) (1) the market conditions characterized by high growth and intense competition, which brought high rates of return to innovating firms, and misery to failing companies; (2) the presence of technological capabilities within the firms; (3) government policies; and (4) a favorable international environment. (pg. 40)*

Regarding the government policies, the authors mentioned that Japan’s growth can be attributed to “getting the basics right” (1996, pg. 259): providing infrastructure, which included transportation, communications, utilities, a legal system (including commercial code and the patent law), establishing standards such as the metric system and eliminating obstacles against mobility.

In the report “Intellectual property and development” by Fink and Maskus (2005, pg. 42), the authors stated that:

*In this context, IPRs are an important element in a broader policy package that governments in developing economies should design with a view toward maximizing the benefits of expanded market access and promoting dynamic competition in which local firms take part meaningfully. That broad package would include promoting political stability and economic growth; encouraging flexible labor markets and building labor skills; continuing to liberalize markets; and developing forward-looking regulatory regimes in services, investment, intellectual property, and competition policy.*

On a similar note, Clark and Kowalski (2012, pg. 432) stated that “development agendas” for developing countries “(...) necessitate focused capacity building efforts, at the levels of human capital, institutional infrastructure, and IT capability”.

## **2.2 The Patent Cooperation Treaty as part of a national IP strategy**

In light of previous remarks, the Patent Cooperation Treaty (PCT) should be analyzed in the context of a wider IP domestic strategy for development.

Regarding PCT and government policy, it's important to note that Japan was a technologically mature country (and one of the most active patent filers worldwide) by the time the country accessed the Treaty in 1978.

United States was also a technologically mature country by 1978, and other countries accessed the Treaty in later stages: South Korea in 1984, China in 1994, and Chile and Peru in 2009, to name a few examples.

Ideally, countries may utilize the PCT as a platform for innovation and economic development when certain conditions are met, such as domestic capabilities and technology creation, human resources and education improvement, among others.

As has been noted, Japan became a leader in many IP fields as a result of a series of top-level political initiatives and consensus. One of the contemporary initiatives was the development of a National IP Strategy in the year 2002.

In the article “Country Focus: IP Revolution – How Japan Formulated a National IP Strategy” (WIPO Magazine, June 2007), former JPO Commissioner Hisamitsu Arai gave a personal account on how Japan developed this new policy to make the country a “top intellectual property-based nation”.

Some of the measures included the creation of a “Strategic Council on Intellectual Property”, in which former Prime Minister Jun'ichirō Koizumi and his Cabinet took part. The Council also included legal professionals, scientists, academics and industry representatives, and they agreed upon action plans and recommendations for the Japanese government.

Five priority areas were defined in the initial plan: IP creation, IP protection, IP commercial exploitation, promotion of creative content and human resource development.

*Prime Minister Koizumi (...) made clear that an IP strategy was to be a key part of an overall national strategy, aimed at making Japan an IP-based nation.*

The result of the work of the Council was the enactment of the “Basic Law on Intellectual Property” in November 2002. Among other provisions, the “Basic Law on IP” gave Japanese universities the capabilities to own and manage their own IP.

The “Basic Law on IP” provided an entirely new landscape in terms of patent protection and technology transfer in Japanese Universities. 2004 marks a turning point for such applicants, as they were granted independence for their IP ownership and management. The Law is perceived as the “Bayh-Dole Act” of the United States (1980) applied by the Japanese government.

Regarding the “Effects of the Japanese strategy for fostering IP rights in Universities”, Mónica Isabel García Mora (2018, pg. 18) argued that:

*In 2002, the Intellectual Property Basic Act specifically established the new mission for Universities in its Article 7, “in light of the fact that their activities are contributing to the creation of intellectual property in the whole society, endeavor voluntary and positive to develop human resources, disseminate research and the research results”. By 2004, National Universities obtained legal independence, which allowed them to be the owners of patent rights.*

### **2.3 A brief history of the Patent Cooperation Treaty (PCT)**

Back in 1966, the main Industrial Property Offices (IPOs) began talks to tackle two issues that were affecting the international patent system. They faced concerns about growing “patent backlog” and redundant work. The countries involved were Japan, the United States, France, West Germany, the Soviet Union and United Kingdom.

The patent backlog (that is, patents of inventions which are not being examined in a timely manner) was increasing due to a growing number of patent applications worldwide, especially from developed countries. Also, IPOs at the time had to carry out prior art searches for patents which already had reports by other offices, leading to redundant work.

The talks for tackling these issues led to international negotiations, in which 77 states took part. The result of the negotiations was the Patent Cooperation Treaty (PCT). The Treaty entered into force in 1978, and it was the second major initiative regarding worldwide patent harmonization after the Paris Convention (1883).

The PCT was also an opportunity to improve the international patent system for the applicants. The main advantages that were included into the Treaty were simpler and cost-effective procedures to file for patents in many countries, and the possibility to delay in which countries to seek protection up to 30 months.

Another key element that benefited the applicants and the work of the Patent Offices was the addition of speedier preliminary examinations processes of patent applications. These include the International Search Reports (ISRs), Written Opinions (WOs) and International Preliminary Examination Reports (IPERs), which provide applicants and Patent Offices with relevant prior art information.

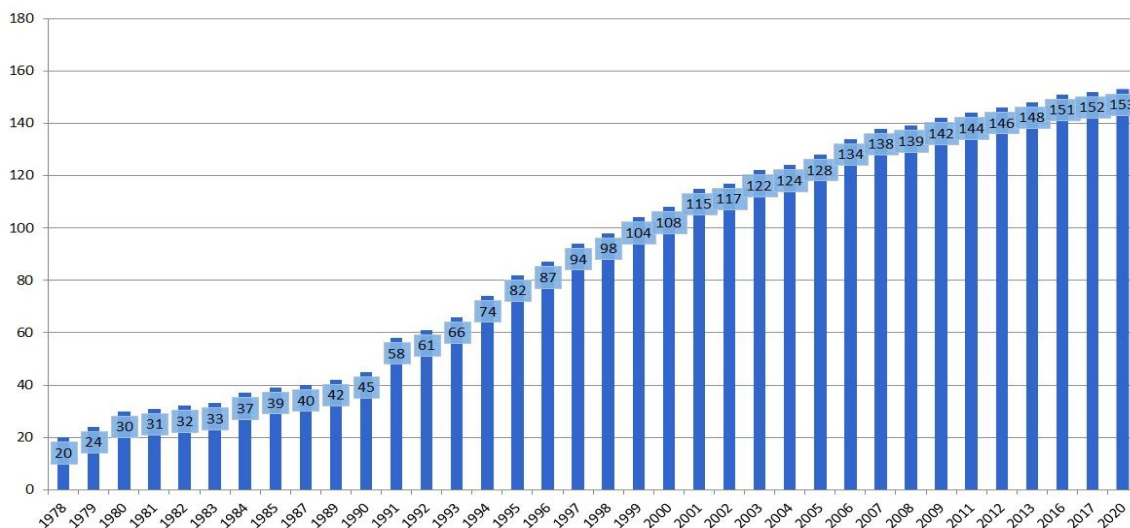
Activities and administrative processes of the Patent Offices of the contracting states were also improved by accessing the Treaty, as they were required to comply with

several international standards. They become able to access and share search reports and to access WIPO services.

According to the Patent Cooperation Treaty Yearly Review (WIPO, 2019):

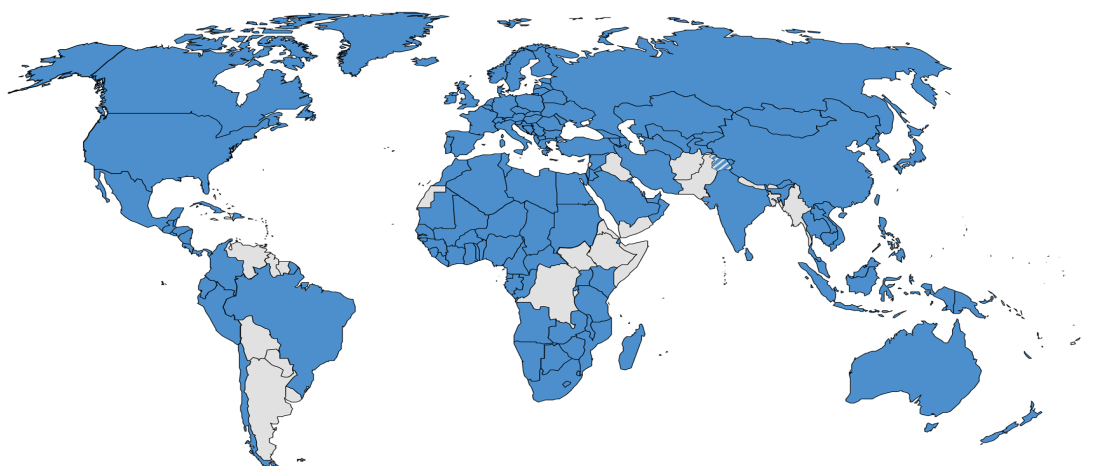
*By 2018, about 80% of the world's countries were members of the PCT. This includes more than 90% of all high-income countries; or, every high-income country with more than 300,000 inhabitants, with the exception of Argentina. About three-quarters of middle-income countries were also members of the PCT, as were just over 70% of low-income economies.*

In terms of evolution of PCT patent applications worldwide, there is a year over year increasing utilization. The bulk of the applications are filed by major international companies from China, the US and Japan.



**Figure 1. Evolution of PCT contracting states over time.**

Source: WIPO. PCT Contracting States ([https://www.wipo.int/pct/en/pct\\_contracting\\_states.html](https://www.wipo.int/pct/en/pct_contracting_states.html)).

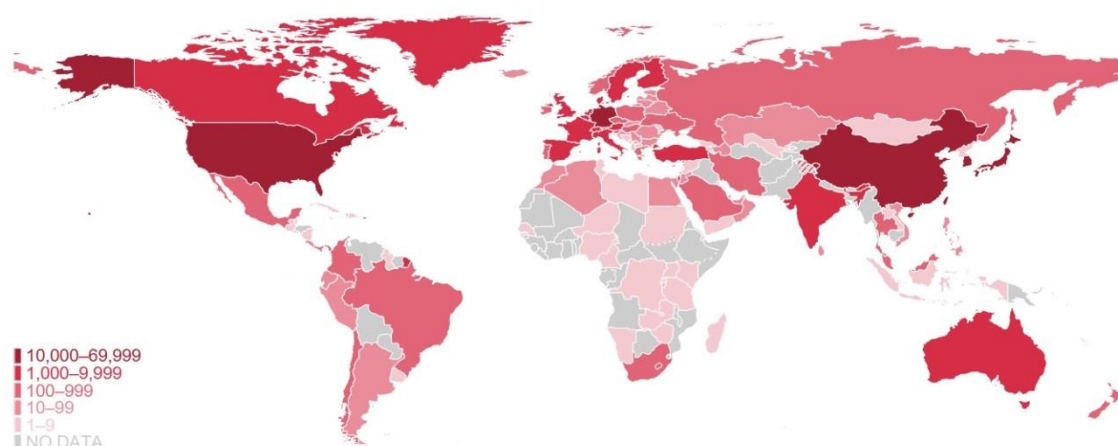


**Figure 2. PCT contracting states (2019).**

Source: WIPO. PCT Contracting States ([https://www.wipo.int/pct/en/pct\\_contracting\\_states.html](https://www.wipo.int/pct/en/pct_contracting_states.html)).

## PCT applications are highly concentrated among a few origins.

A6. PCT applications by origin, 2018



Note: Data for 2018 are WIPO estimates.

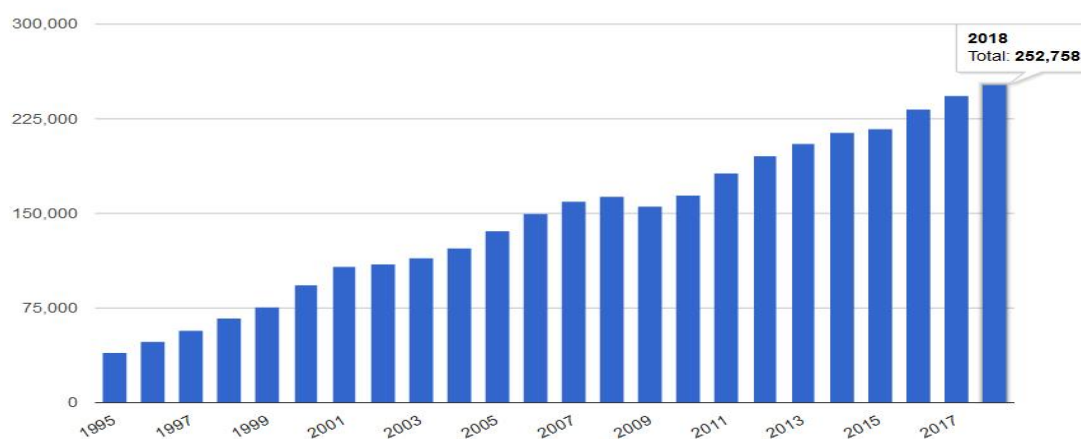
Source: WIPO Statistics Database, March 2019.

**Figure 3. PCT applications by origin.**

Source: WIPO PCT Yearly Review 2019.

## 2.4 A comparison between Paris Convention route and PCT route

The following figure exemplifies how the Paris Convention (Direct) and the PCT route differ. As can be observed, by utilizing the PCT route, applicants have more time to decide entering national phases.

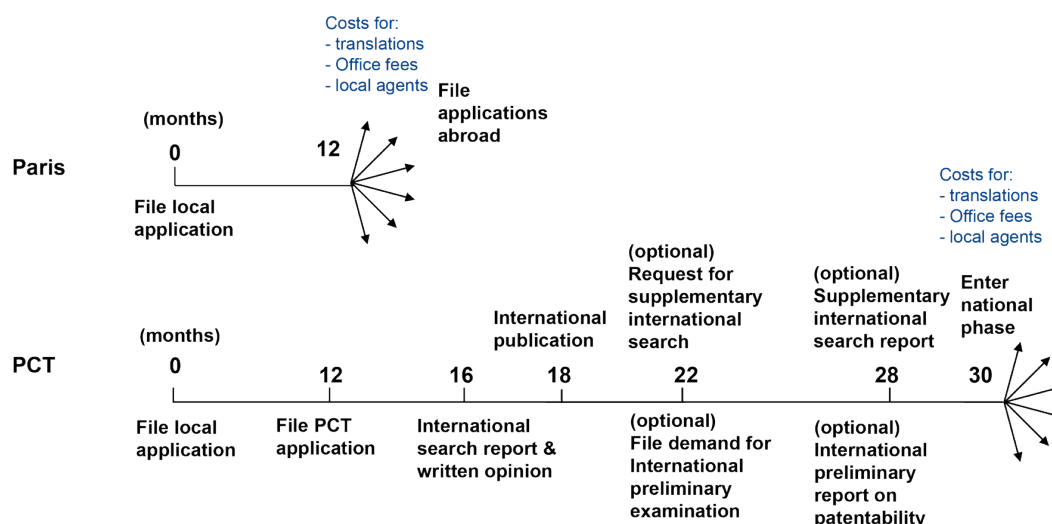


**Figure 4. Evolution of PCT patent applications worldwide.**

Source: WIPO Statistics Database.

## 2.5 Patent information as an innovation driver

In the article “Harnessing the power of patent information to accelerate innovation”, Clark and Kowalski (2012, p. 427) argued that “Patents are a unique source of



**Figure 5. Comparison between the Paris Convention route and PCT route.**

Source: WIPO. PCT FAQ (<https://www.wipo.int/pct/en/faqs/faqs.html>).

information containing not only legal but also technical, business, and potentially policy-related information”.

Generally speaking, patent applications are published after 18 month from the earliest filing date. This provision means that patent information databases have an 18-month delay, unless applicants decide to ask for an earlier publication.

However, taking into consideration that applicants file for patents before commercializing the technology, patent databases are the first places in which new technologies can be observed. Journalists often publish news stories about patent filings by big tech companies discovered in these databases, speculating about future products.

Fortunately, patent information databases are readily available, many of them open and free. The internet has “democratized” their access. Almost all national Patent Offices maintain the databases of patent applications filed in each country.

As for quantity of applications, Espacenet (from the European Patent Office) states that the database contains 110 million patent documents from Patent Offices worldwide. WIPO’s Patentscope contains almost 82 million documents.

Patent document databases can be searched utilizing a wide variety of criteria, such as title, abstract, dates of filing or publishing, names of inventors and applicants, fields of technology, among others.

It should be noted that the database requires skills and practice in order to perform quality patent information searches and to obtain relevant search results. The difficulty



can be tackled by participating in webinars and workshops organized by WIPO and the Patent Offices.

It's also worth mentioning that WIPO and some Patent Offices around the world are implementing the Technology and Innovation Support Centers (TISC), which aim at providing training and capacity building that includes patent database searching and IP management, among others activities.

Returning to the topic of patent information as an innovation driver, Clark and Kowalski also expressed that “Once mastered patent information can facilitate the transformation of a resource-based economy to a knowledge-based economy”.

### **2.5.1 What makes Patentscope unique as an information source?**

As mentioned in the previous section, the Patent Cooperation Treaty (PCT) served the purpose of harmonizing patent filing procedures and for sharing patent information.

The exchange and publication of information that took place within PCT was transformed by the arrival of a widespread utilization of the internet, which happened many years after the creation of the PCT.

In this new technological context, WIPO developed Patentscope. Patentscope contains abstracts and full texts of patents, information about applicants and inventors. It can be searched by combining multiple fields, making it a very powerful information tool.

Patentscope hosts two main sources of patent data and related information:

1. Applicants and third parties can access patent applications filed via the PCT, as well as a number of national collections, by searching the database using various criteria.
2. Applicants and third parties can also access high quality prior art information contained in the International Search Reports (ISRs), Written Opinions (WOs), and International Preliminary Examination Reports (IPERs).

The second source of information is the feature that sets Patentscope apart from other patent information databases (except Espanecet): the ability to access ISRs, WOs and IPERs of the patents filed via the PCT system.

These documents are useful for applicants, as they are informed about prior art searches related to their inventions. Third parties can also access such documents. The reports can be accessed and downloaded freely.

The ISR/WO typically includes: citations to the prior art of the invention (for example patents, scientific papers, and so on); an indication if the documents affect the

patent requirements of novelty, inventive step and industrial applicability; the search strategy of the examiner, and the classifications of subject matter (IPC and CPC).

Lastly, Patentscope also offers a wide variety of built-in tools for translating patent documents and for conducting searches in several languages at the same time.

## **2.6 Japan and the PCT**

As previously noted, Japan was among the countries with the most patent filings in 1960, and the country participated in the discussions that led to the creation of the PCT. The country was the 19<sup>th</sup> member country to access the PCT and the Patent Office began receiving PCT applications in October 1978.

In fact, the only languages allowed for international publication by the original regulations of the Treaty were Japanese, English, French, German and Russian. More languages were added in later stages.

Japanese companies, universities and inventors make extensive use of the PCT, with 49,702 international applications filed via the Treaty in 2018 alone (WIPO, 2019). Japan is, in this regard, one of the three top applicants by PCT applications behind the US (with 56,142 PCT applications) and China (53,345).

### **2.6.1 Overview of PCT utilization by universities**

In numbers, PCT applications in Japan are mostly filed by big companies, but Universities are also users of the system. By quantity of applications, Japanese Universities which utilize the system are University of Tokyo (271 PCT applications in 2018), Osaka University (208) and Kyoto University (155).

As the PCT is a method for filing patents in multiple countries, it makes sense for the universities to seek to optimize costs in the international patent filing procedures, and to have simpler and speedier processes for their granting. It makes sense, as a result, to make use of the PCT when filing for patents in foreign countries.

According to the website of the University of Tokyo (UTokyo), as of March 2018, the situation regarding patents was the following:

### **2.6.2 Overview of PCT utilization by companies**

As regards PCT utilization by Japanese stakeholders, big companies take the lead. Of the top 50 PCT applicants globally, 16 are Japanese (WIPO 2019).

**Table 1. Japanese companies in the Top 50 PCT applicants by patent quantity.**

<b>Position (Japan)</b>	<b>Position (World top 50)</b>	<b>Applicant</b>	<b>Published Applications (2018)</b>
1	2	MITSUBISHI ELECTRIC CORPORATION	2.812
2	12	PANASONIC IP MANAGEMENT CO., LTD.	1.465
3	13	SONY CORPORATION	1.342
4	16	SHARP KABUSHIKI KAISHA	1.132
5	19	DENSO CORPORATION	998
6	21	FUJIFILM CORPORATION	962
7	22	NEC CORPORATION	947
8	23	MURATA MANUFACTURING CO., LTD.	889
9	25	OLYMPUS CORPORATION	750
10	27	HITACHI, LTD.	714
11	33	HITACHI AUTOMOTIVE SYSTEMS, LTD.	582
12	37	HONDA MOTOR CO., LTD.	504
13	38	SONY SEMICONDUCTOR CORPORATION	467
14	40	NTT DOCOMO, INC.	450
15	42	FUJITSU LIMITED	442
16	46	KYOCERA CORPORATION	413

The Japan Intellectual Property Association (JIPA) published a report about the utilization of the PCT system by Japanese companies and the document stated that the PCT is used when the companies are “expanding their business activities to the world”.

The report surveyed 51 companies from a wide range of sectors: electricity, communications, pharmaceuticals, chemicals, metals, machinery, automobiles and others.

Compared to a similar study carried out in 2006, the authors noted that “the international application rate is shifting to higher percentages”. That is, Japanese companies are utilizing the PCT system more frequently, especially in “chemicals, metals and machinery” business sector.

As regards the purpose of using PCT applications, the main reasons indicated by the companies were: Decision on licensing necessity and number of applying countries (necessity of translation costs) can be delayed (69% of companies), Due to a large number of countries for licensing, procedures for Paris route are too complicated (16%), Decision on necessity of entering national phase can be made during the international search and preliminary search (8%) and Urgent application (decision for the international application is made at the very last minute of priority date) (2%).

As regards as the reasons for not using PCT applications, the primary reasons were: Necessity for licensing and applying countries are already determined at the time of filing (35%), Small number of countries for licensing (33%), Applying to countries or regions which are not PCT members (26%), Want to license immediately (2%), PCT route doesn't have much advantages from the aspects of costs and man-hours (2%) and Others (2%).

Another key finding of the survey was that companies are utilizing the Direct PCT application more frequently. Reasons for utilizing the Direct PCT application are: To determine patentability by early International Search Report (ISR) (31%), To emphasize international expansion (27%), To obtain license earlier in the countries for entering national phase (22%), Easier management by using PCT (11%), Earlier judgment on the countries for entering national phase by early ISR (4,5%), and To use the Patent Prosecution Highway (PPH) (4,5%).

Regarding entering the national phase, the majority of companies mentioned that they make the decision when the time limit for entering national phase is approaching (88%). Another time for making the decision was: During the filing of PCT application (8%) and at the time of first filing (4%). They concluded that “They are making good use of such advantages of the PCT system”.

In another report, entitled “People in their forties: In their most productive years? – Patent Cooperation Treaty (PCT) and Japan”, Kunitoshi stated that the PCT “supports the world’s business and innovation from the perspective of intellectual properties.” The author noted that, by accessing the Treaty in 1978, “Japan took a large step toward globalization”.

The author mentioned the demands being met by the PCT: Globalization of Japanese companies, protection of business predominance and patents (technologies and expertise) overseas, and the simplicity for filing patents in numerous countries.

“Although the ratio of PCT applications from Small to Medium Sized Enterprises (SMEs) is still small”, the author stated, “the number has shown a tendency to increase recent years”.

The Japan Patent Office (JPO), as an International Searching Authority (ISA), carries out International Searches for domestic applicants and also for foreign applicants that select JPO as the Searching Authority for their patent applications. From 2010, these efforts focused on “ASEAN countries into which many Japanese companies expanded”.

As a “success story” of PCT applications, the report mentioned contributions by Prof. Shinya Yamanaka (University of Kyoto) related to pluripotent stem cells (iPS cells). The University applied for patents related to IPS technologies in 30 countries, and Prof. Yamanaka was awarded a Nobel Prize in Medicine in 2012.

## 2.7 Argentina and the PCT

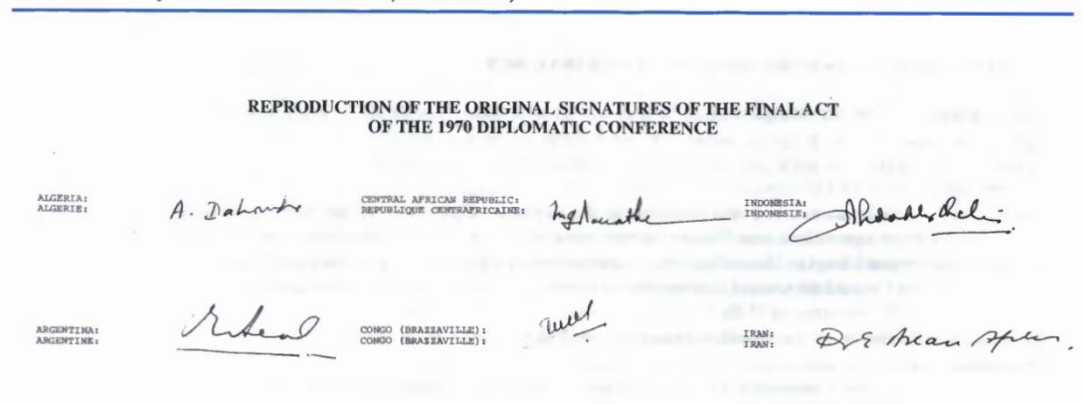
From a foreigner point of view, the reasons why Argentina has not accessed the PCT may seem difficult to understand. The fact is surprising, taking into account that the country is a major international economy and a member of the “Group of Twenty” (G20) economic forum.

While The Patent Cooperation Treaty (PCT) was being developed, Argentina was in the midst of civil and political turmoil. From 1966, the country was governed by a Military Junta who deposed President Arturo Illia. It was the same year that conversations started for a new multilateral treaty regarding patents, and that would eventually lead to the Patent Cooperation Treaty.

During the development of the PCT, Argentinian representatives participating actively in work meetings. Minutes of the meetings that took place in the Washington Diplomatic Conference of 1970 corroborate the fact. Key people involved included Argentinian Ambassador to the US at the time, Pedro Eduardo Real.

Argentina was also one of the 18 countries that signed the Treaty in the 1970 Diplomatic Conference. In the following years, however, Argentina refused to ratify and access the Treaty via its legislative branch.

*The First Twenty-Five Years of the PCT (1970 - 1995)*



**Figure 6. Reproduction of the signature of Argentina's Ambassador Pedro E. Real (1970).**  
Source: “The first twenty-five years of the PCT” (WIPO).

In retrospect, it's paradoxical that Argentina, 41 years later and having contributed to the creation of the PCT, hasn't accessed the Treaty.

In 1998 there was an attempt to access the PCT by Argentinian legislators and the Argentinian Industrial Property office (Instituto Nacional de Propiedad Industrial, INPI). During that time, the proposal to access the PCT was approved by the Chamber of Senators, but didn't pass the debate on the Chamber of Deputies.

During the legislative debate following the attempt to access the PCT, the substitute Syndicate of INPI, Guillermo Vidaurreta, expressed:

*As regards to patents, international policy is giving way to a curse that Argentina alone won't be able to change (...) It's true that Argentina cannot have a Defense Ministry like that of the United States, but it's also true that there are other objectives that can be met with a political decision. I'm sure that with the current directorate we can have the best Industrial Property Office of Latin America and one of the best of the world. (Deputy Chamber, Industry Commission Meeting, March 15, 2001)*

Even though the INPI at the time was in favor of accessing the PCT, the debate remained in a standstill until recently.

### **2.7.1 Current status of the debate about PCT**

As previously noted, the fact is that 41 years after its implementation, 153 countries have joined the PCT. Most countries are part of the international initiative, particularly countries with high levels of patent activity.

The issue is recognized by the Argentinian Industrial Property Office (Instituto Nacional de la Propiedad Industrial, INPI), legal firms of IP and legal specialists, but these are the only voices on the public sphere that demand the attention that this issue deserves.

Currently, the PCT is back on the public agenda because of the ongoing negotiations regarding a trade agreement between Mercosur and the European Union (Díaz, 2019).

The Mercosur is the trade bloc of Latin America (consisting of Brazil, Argentina, Paraguay and Uruguay), and it is considered that the accession of the PCT will be a requirement for the signing of the trade agreement with the EU.

### 2.7.2 The opinions against accessing the PCT

Analyzing the IP regimes of Argentina, Brazil and Mexico, Prof. Shadlen (Intellectual Property Watch, 2019) expressed his views on the different approaches regarding the pharmaceutical sector in each country:

*(...) Argentina produced a 'market-preserving' patent regime, featuring minimalist, by-the-books adherence to the country's new international obligations, complemented by regulatory changes designed to help local firms adjust to the new status quo and retain a dominant position vis-à-vis with respect to international competition. Brazil yielded a "neo-developmental" system, with the country adopting global norms in a way that puts IP and innovation at the heart of development policy, but at the same time introducing a range of measures designed to ameliorate the effects of stronger protection. And Mexico produced an "internationalist" patent regime, marked by an expanding embrace of global norms and adoption of "best practices," all with an eye toward attracting foreign investment into the pharmaceutical sector.*

Some Argentinian pharmaceutical companies, represented by organizations such as Cámara Industrial de Laboratorios Farmacéuticos Argentinos (CILFA) and Cámara Industrial Empresaria De Laboratorios Farmacéuticos (COOPERALA), argue that joining the PCT will have a series of harmful consequences.

For them, accessing the Treaty will be detrimental to their industry, the jobs they provide, public access to medicines and the development of the country.

Some of the reasons can be summarized as follows (CILFA, 2018):

- The PCT implies a transfer of sovereignty in the matter of legislative policy on patents and industrial development.
- The PCT promotes the operational and administrative relaxation of national Industrial Property Offices that will rely on international criteria, departing from local criteria. It is dangerous for the continuity of the application of rigorous patentability guidelines.
- The main beneficiaries of the PCT are the countries and companies with the greatest technological development. The US, Japan and Germany represent almost 60% of PCT applications. All developing countries in the world do not exceed 1% of total PCT applications.
- By increasing PCT patents for multinational companies, obstacles to competition for local businesses will be increased, affecting their viability and sources of employment.

- The PCT does not provide advantages for national companies and inventors. On the contrary, it is much more efficient and less expensive to adopt state support programs through non-refundable contributions and support for international patenting, rather than adopting a system that will increase the proliferation of monopolies to foreign companies.
- The PCT will require an increase in the IP office budget to meet the increase in patent applications. Thus, the adoption of the PCT implies a higher budgetary cost for the country destined to finance foreign monopoly rights, instead of promoting innovation and national development with these funds.
- Specifically, in the pharmaceutical market, the PCT promotes the import of foreign legislation and the adoption of foreign patentability criteria that have led to the propagation of inventive low-level patents, granted for minor developments, which end up creating barriers that hinder and even prevent legitimate competition in the medicine market.

Academics and public policy advisors, such as Carlos Correa (Argentina), had raised questions regarding the convenience of accessing the PCT by Argentina, citing patentability criteria, public access to medicines and prices as primary concerns (Correa, 2010).

It's often argued that the PCT only benefits big companies in developed countries (such as Huawei, ZTE, Intel, Mitsubishi, etc.) and the Universities of such countries.

But the question arises: “Is it possible to judge the merits of the PCT by looking only at the top filers by number of applications?” It seems that in this way, it's easy to lose perspective of the purpose and the scope of the PCT as a facilitator for innovation for a wide range of organizations and companies.

### **2.7.3 PCT applications by Argentinian residents**

Argentinian applicants, not being able to opt for filing patents via the PCT system, usually try to find a way around the issue and to make use of the features of the PCT.

Typically, Argentinian applicants who need to file a patent via PCT partner with residents of PCT contracting states. Chile, Brazil and Spain are popular choices for this task. Alternatively, they would partner with Argentinian residents who have double nationality (for example, Italian/Argentinian nationality).



On the other hand, private companies which have offices in PCT contracting states, may file for patents through those offices (usually located in the United States). Surprisingly, this is the case of some pharmaceutical companies that oppose Argentina accessing the Treaty (Estenssoro, 2019).

Mr. Juan Gregorio Pozzo (2019), a member of the Chamber of Argentine Entrepreneurs (ASEA), stated in an article that:

*Many entrepreneurs, SMEs, science and technology centers or Argentine universities, with high and proven innovative capacity in technology, in order to take advantage of the PCT, to raise capital, develop their technology and reduce costs, are forced to establish societies in countries where the PCT is applicable, or they go to foreign citizens of those countries, with whom they have no real ties, and share or delegate ownership of their inventions.*

## 2.8 Latin America and the PCT

While Argentina decided to place the accession to the PCT in a standstill, many countries accessed the Treaty over the years, including most of the developed and developing countries of the world.

For instance, countries of Latin America such as Brazil, Chile, Colombia, Mexico and Peru (among others) joined the Treaty and began utilizing the system to promote domestic inventions and technologies.

**Table 2. Some of the countries of Latin America that have accessed PCT.**

<b>Two-Letter Code</b>	<b>State name</b>	<b>Date on which State became bound by the PCT</b>
BR	Brazil	9 April 1978
CL	Chile	2 June 2009
CO	Colombia	28 February 2001
MX	Mexico	1 January 1995
PE	Peru	6 June 2009

As can be seen in the following section, PCT patent applications (WO-) in these countries show an overall increasing trend year over year (Note: 2019 data is still incomplete due to the 18 month period before publication).

### 2.8.1 Brazil

Date of PCT accession: 9 April 1978.

Total PCT Applications: 10,682 (Until December 2019).

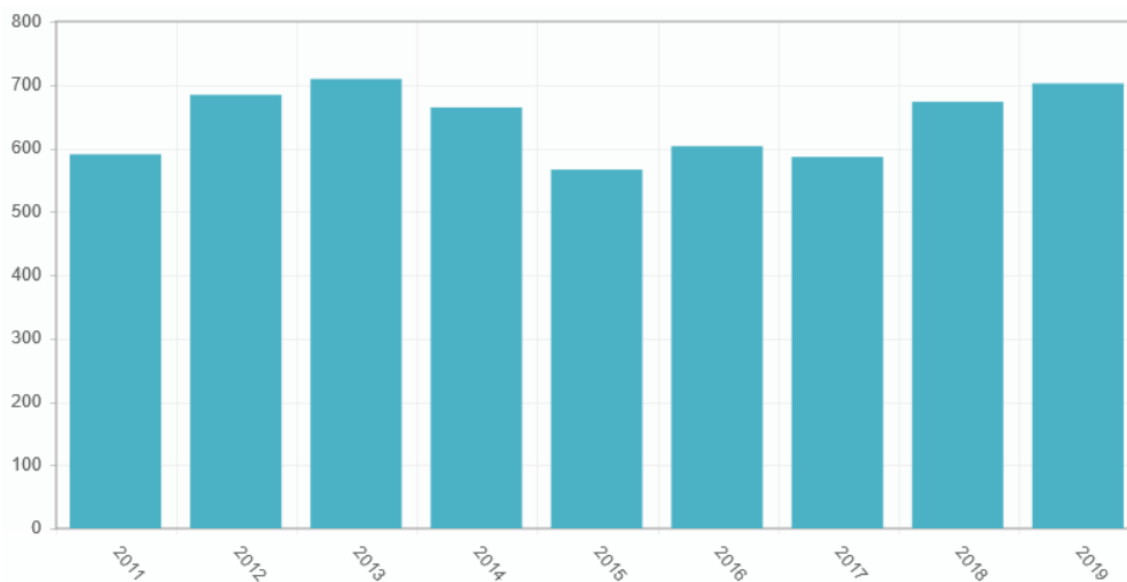


Figure 7. Brazil. Evolution of PCT applications.

Table 3. Brazil. Top PCT applicants.

Top PCT applicants	Count
Whirlpool s.a.	297
Universidade Estadual de Campinas - Unicamp	178
Universidade Federal de Minas Gerais - Ufmg	108
Mahle International GMBH	102
Mahle Metal Leve s/a	98
Petroleo Brasileiro S.A. - Petrobras	98
Braskem s.a.	81
Natura Cosmeticos s.a.	76
Carrier Corporation	71
L'oreal	71

## 2.8.2 Chile

Date of PCT accession: 2 June 2009.

Total PCT Applications: 1,733 (Until December 2019).

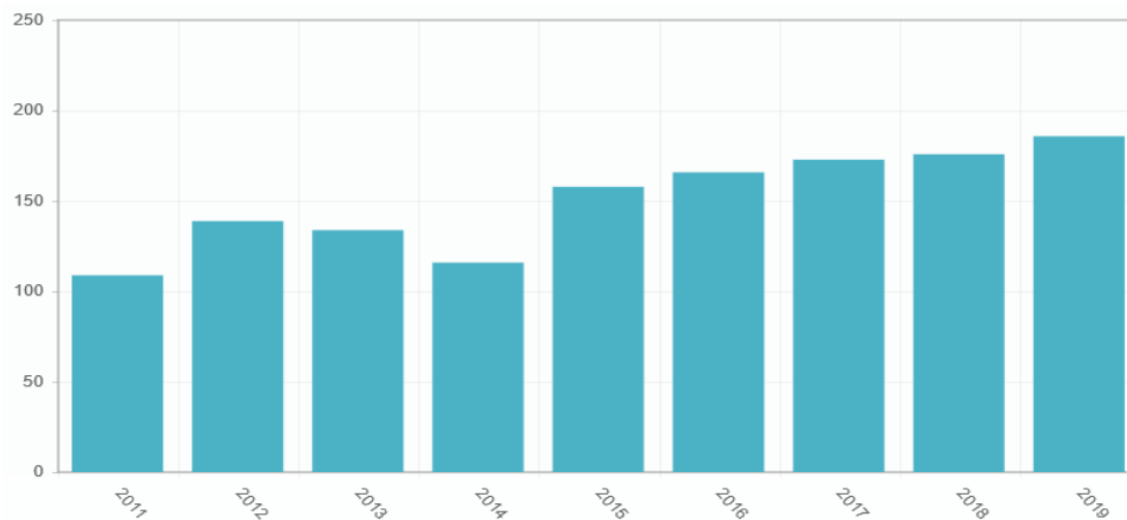


Figure 8. Chile. Evolution of PCT applications.

Table 4. Chile. Top PCT applicants.

Top PCT applicants	Count
Pontificia Universidad Catolica de Chile	103
Universidad de Chile	92
Universidad de Santiago de Chile	88
Universidad de Concepcion	48
Universidad Tecnica Federico Santa Maria	29
Universidad de la Frontera	18
Vulco S.A.	18
NV Bekaert SA	17
Weir Minerals Australia ltd,	17
Pontificia Universidad Católica de Chile	16

### 2.8.3 Colombia

Date of PCT accession: 28 February 2001.

Total PCT Applications: 1,193 (December 2019).

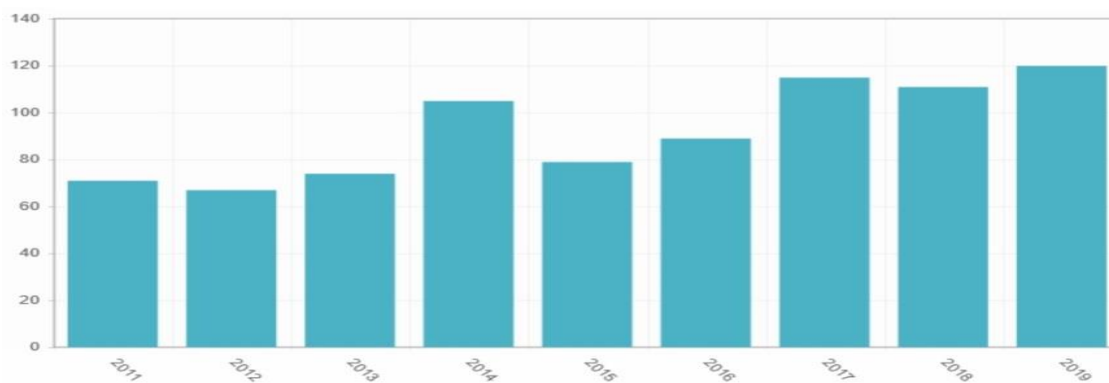


Figure 9. Colombia. Evolution of PCT applications.

Table 5. Colombia. Top PCT applicants.

Top PCT applicants	Count
Ecopetrol S.A.	43
Universidad EAFIT	38
Universidad Nacional de Colombia	35
Universidad industrial de Santander	24
Universidad de Antioquia	19
Universidad de los Andes	19
Universidad del Valle	18
Pontificia Universidad Javeriana	16
Universidad Pontificia Bolivariana	13
Team foods Colombia S.A.	12

## 2.8.4 Mexico

Date of PCT accession: 1 January 1995.

Total PCT Applications: 4,533 (December 2019).

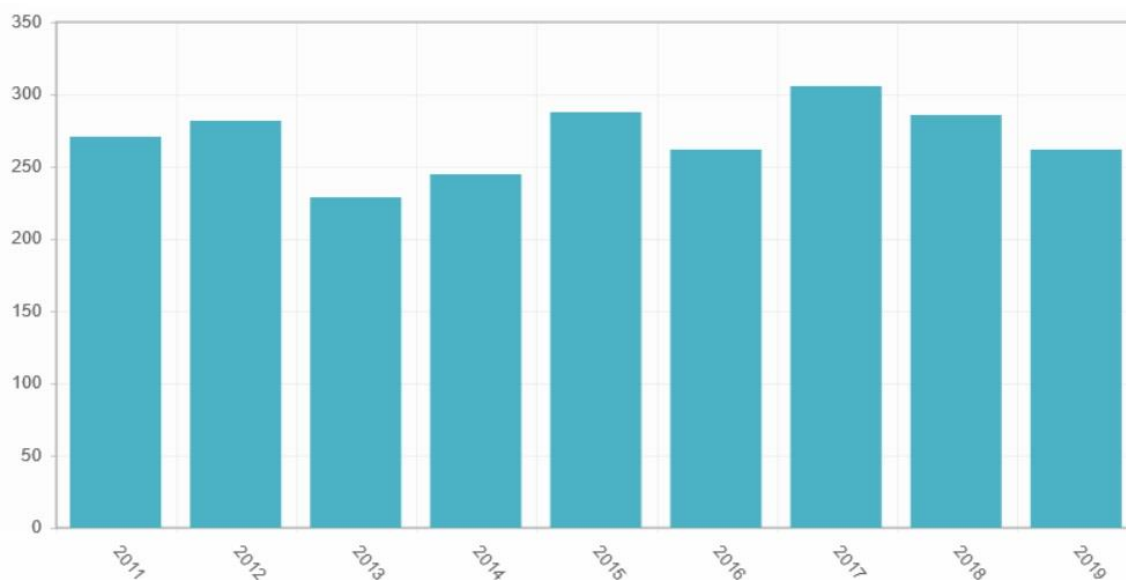


Figure 10. Mexico. Evolution of PCT applications.

Table 6. Mexico. Top PCT applicants.

Top PCT applicants	Count
Universidad Nacional Autonoma de Mexico	113
Instituto Tecnologico y de Estudios Superiores de Monterrey	53
Santos Murillo, Josefina	44
Centro de Investigacion y de Estudios Avanzados del Instituto Politecnico nacional	42
Alvarez Ochoa, Victor Guillermo	37
Garcia Armenta, Maria Elena	37
Mexichem Fluor	37
Mexichem Amanco Holding	36
Mexichem UK Limited	31
Instituto Mexicano del Petroleo	27

## 2.8.5 Peru

Date of PCT accession: 1 January 1995.

Peru: total PCT applications 247.

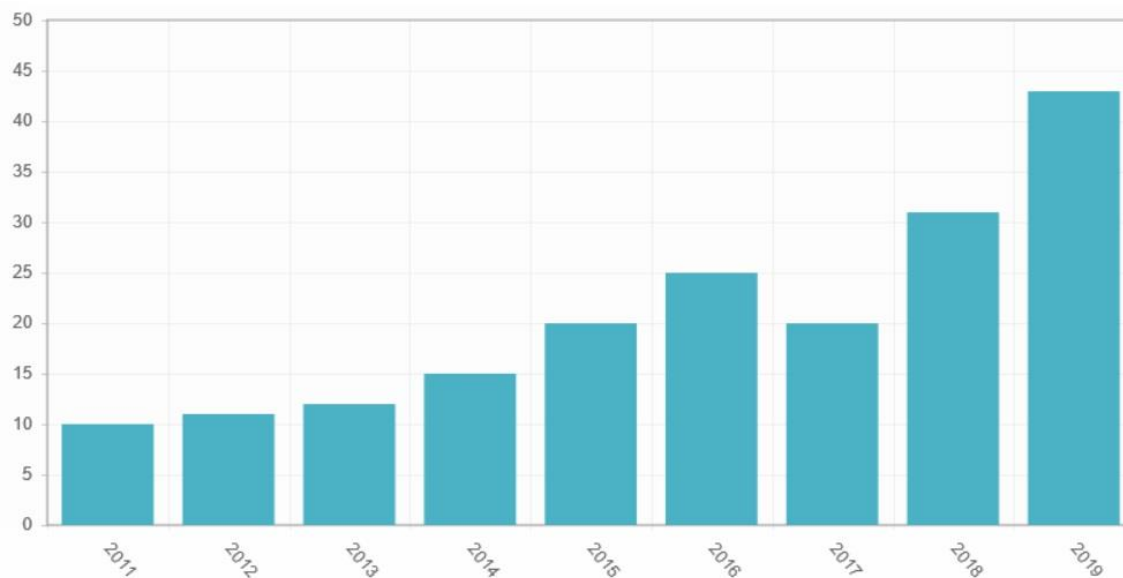


Figure 11. Peru. Evolution of PCT applications.

Table 7. Peru. Top PCT applicants.

Top PCT applicants	Count
Pontificia Universidad Catolica Del Peru	9
Sud-Chemie AG	5
Barry, Bridget	4
Blum, Ronald, D.	4
Camus Loredó, Jorge Luis	4
Condemarin, Rosalina	4
De La Rue, Michael	4
Duston, Dwight, P.	4
Exsa S.A.	4
Groeger, Elizabeth	4

## **2.9 PCT utilization examples from Latin America**

As regards as useful examples of PCT utilization, there are many examples from domestic innovators in countries of Latin America. From entrepreneurs, solo inventors to universities and companies, domestic applicants are utilizing the PCT for protecting their inventions abroad.

As seen in the previous section, the top applicants of PCT applications in Mexico are the universities. An interesting example in the case of private companies is “Grupo Rotoplas SA”, which utilizes the PCT system for filing for patents in countries of Latin America, the United States and Europe.

Interesting examples of PCT utilization in Brazil are the companies Whirlpool and Embraer. Whirlpool is the Brazilian subsidiary of the multinational Whirlpool Corporation, which performs R&D activities in Brazil. The company Embraer is a world-class manufacturer of aircrafts, and the company utilizes the PCT to protect technologies in Brazil, United States, Canada and Europe.

### **3. Methodology of the study**

The present research will consist on a descriptive approach, and it will be centered on bibliographical review, statistical data collection and analysis regarding the utilization of the Patent Cooperation Treaty (PCT) by prominent Japanese Universities and companies.

Additionally, interviews with relevant IP staff of stakeholders and PCT experts will be conducted in order to gain first-hand insights of PCT utilization and IP strategy.

#### **3.1 Bibliography and previous studies**

Search and analysis of bibliography and previous studies included thesis of Long-Term Researchers at APIC / JPO Cooperation in Human Resource Development. Although there were no thesis associated with the Patent Cooperation Treaty (PCT) in Japan or elsewhere, some thesis were useful for other sections of the study.

Regarding general bibliography, the main topics analyzed there the Patent Cooperation Treaty (PCT) in general, the impact and merits of the PCT, the link between the patent system and development, and the PCT debate in Argentina (past and present). Sources included peer-reviewed articles and newspapers.

#### **3.2 JPO/IPR Short Courses**

- FY2019 JPO/IPR Training Course on “Academia-Industry Collaboration and Technology Transfer”, from Aug. 20 to Aug. 29. The course was very useful to my research, because I could learn from first-hand experiences of Universities in Japan utilizing the patent system and the PCT system.
- FY2019 JPO/IPR Training Course on “Information Technology” was useful to my research because the lecture given by Mr. Kiyotaka Kaneko (from Fujitsu) allowed me to know the utilization of IP Information by a leading global firm.



### **3.3 Interviews to Japanese stakeholders**

The interviews were planned with 3 main topics in mind. The first topic was the impact of the PCT and its merits of the PCT in the case of Japan, in order to obtain first-hand opinions of the Japanese experience with the PCT system. The second topic was oriented at the utilization of the PCT by universities and companies. Lastly, the third topic was about PCT awareness and promotion among the Japanese applicants.

Questions were adapted to suit the specific organization and role of the person being interviewed. In some cases, interviewees were asked about the situation of the PCT in Argentina, and the importance of increasing awareness of the issue among Argentinian stakeholders.

#### **3.3.1 The persons in charge of IP or technology licensing in Japanese Universities**

University of Tokyo (UTokyo)

- Mr. Takafumi Yamamoto - CEO & President, Todai TLO, University of Tokyo.

Tokyo Medical and Dental University (TMDU)

- Prof. Kimiyoshi Watanabe - Head, Patent Attorney, Junior Associate Professor, Institute of Research Division for Research Innovation, Research Center for Industry Alliances, Tokyo Medical and Dental University (TMDU).
- Mr. Naoyuki Morisaki - Institute of Research Division for Research Innovation, Research Center for Industry Alliances Tokyo Medical and Dental University (TMDU).

#### **3.3.2 Relevant committees of Japan Intellectual Property Association (JIPA)**

The entity is a non-profit, non-governmental organization which has more than 1300 members. According to their website (JIPA, 2019) the organization “represents industries and users of the intellectual property (IP) system, and provides related institutions all around the world with well-timed, suitable opinions on improvement of their IP

systems and their utilization”. Representatives from Japanese companies which are members of the International Affairs Committee (2019) and Pharmaceuticals and Biotechnology Committee (2019).

### **3.4 Experts for PCT in Japan and WIPO**

#### **3.4.1 Officials of the International Cooperation Division of Japan Patent Office (JPO)**

- Mr. Minoru Nitta – Deputy Director, International Cooperation Division, Japan Patent Office (JPO).
- Mr. Hiroki Watanabe – Deputy Director, Regional Cooperation Office, International Cooperation Division, Japan Patent Office (JPO).
- Mr. Daisuke Nakagawa – Specialist for International Information, Regional Cooperation Office, International Cooperation Division, Japan Patent Office (JPO).

#### **3.4.2 Japanese Expert for PCT**

- Mr. Teruhisa Shimomichi - Former patent examiner, Director of Patent Information Planning Division at JPO, Director of Video Equipment Examination, and member of PCT Administration Department at WIPO.

#### **3.4.3 Official of PCT International Cooperation Division of World Intellectual Property Organization (WIPO)**

- Mr. Rolando Hernández-Vigaud - Head of Offices Services Section, PCT International Cooperation Division, World Intellectual Property Office (WIPO).

## 4. Results and analysis

### 4.1 Introduction

Japan has a long tradition of Intellectual Property (IP) utilization, awareness and promotion and, in the field of patents, the country has been a true pioneer. As mentioned in the previous sections, Japan was one of the main patent filers by the time the Patent Cooperation Treaty (PCT) was created, a trend that continues to this day.

According to WIPO statistics, Japanese applicants filed for 313,567 patents and utility models in 2018 (the figure includes PCT and non-PCT applications). This means Japan is the 3<sup>rd</sup> most active Patent Office behind China (1,542,002 applications) and the United States (597,141 applications).

Renowned Japanese companies, such as Sony, Panasonic, Fujitsu, Konica Minolta, Kodak, Toyota, Mitsubishi and many other have been great innovators that leveraged the IP system to increase their market share and competitive advantage.

Japanese Universities, on the other hand, make use of the PCT to a lesser degree, aiming at protecting significant developments, research results and technologies arising from University research activities.

Within this context, two major Japanese Universities are going to be analyzed in how they utilize and recognize the PCT: the University of Tokyo (UTokyo) and the Tokyo Medical and Dental University (TMDU).

### 4.2 Japanese Universities and the PCT

According to the “Patent Cooperation Treaty Yearly Review 2019” (WIPO), the top 5 Universities in Japan by PCT patent applications filings are:

**Table 8. Top Japanese universities by PCT applications.**

<b>Position (Japan)</b>	<b>Position (World top PCT)</b>	<b>Applicant</b>	<b>Published Applica- tions (2018)</b>
1	242	Osaka University	105
2	280	University of Tokyo	92
3	300	Tohoku University	87
4	304	Kyoto University	86
5	431	Kyushu University	61

## 4.2.1 University of Tokyo (UTokyo)

When it comes to patent filing by Universities in Japan, the University of Tokyo (UTokyo) takes the lead. In total, the University has filed approximately 6,570 patents.

**Table 9. Patents belonging to UTokyo (March 2018).**  
Source: <https://www.u-tokyo.ac.jp/en/about/finances.html>

<b>Domestic patents</b>	
Applied for	6,306
Held	1,749
<b>International patents</b>	
Applied for	5,924
Held	1,583
<b>Licensed patents</b>	
Licensed	3,593
Providing income	1,944
Income (thousand yens)	4,126,827

During the JPO/IPR Training Course about “Academia-Industry Collaboration and Technology Transfer”, Professor Shigeo Kagami (General Manager, Office of Innovation and Entrepreneurship) described some characteristics of the UTokyo.

He referred to the “Incorporation of Japan’s National Universities”, which took effect from 2004. This was a major reform on the education system, and it’s considered to be the “Bayh-Dole Act” of Japan. Each national university was incorporated and de-regulated in terms of budget and personnel, and this allowed the institutions to “own” intellectual property, such as patents. External funding and commercialization of university technologies were given a greater importance.

As explained by Prof. Kagami during the training course, UTokyo implements an Innovation Ecosystem based on Open Innovation, where Basic Research (University) interacts with Business Development (Industry) and Applied Research Commercialization (University Startups). This ecosystem allows incubation, technology transfer, research collaboration, entrepreneurship, partnerships and mergers and acquisitions.

Regarding royalties of university technologies licensing, UTokyo established that 30% should go to the University, 30% to the Institute(s) or Laboratory(s) with which the

inventor is affiliated, and 40% to the inventor (s), after deduction of administration fees and patent expenses.

An interesting topic regarding IP management and technology transfer in UTokyo is the fact that its Technology Licensing Office (TLO) is a private enterprise. As such, the company establishes its own organization and rules, and it's able to manage the IP from UTokyo as a subsidiary of the University.

Mr. Takafumi Yamamoto (CEO & President of Todai TLO, University of Tokyo) mentioned that the benefit of having an independent TLO is that it allows maintaining a permanent structure in terms of human resources and know-how. "To be frank, Japanese universities are bureaucratic and slow to make decisions. In many cases, university staff moves every two years or every three years, and know-how and skills cannot be retained".

In terms of royalties perceived by UTokyo, Yamamoto mentioned that "Last year we earned about twelve million US dollars in royalty income. (...) The royalty income is also increasing year by year. All Japanese Universities combined get about 30 million US dollars in royalty income".

Invention disclosures coming from students or faculty members are submitted to the TLO, which is responsible for examining requests and determining if the University shall proceed with the protection of the invention.

"After the filing of the patent application, we start marketing and licensing" Mr. Yamamoto explained. "After we file a patent application in Japan, we have one year to file a PCT patent application, and one year is enough for us to approach the Japanese companies".

Mr. Yamamoto also clarified that, although the Japanese market is still strong, startup companies funded at UTokyo are focusing on international markets due to the decrease of the population of Japan in the future.

#### **4.2.2 Tokyo Medical and Dental University (TMDU)**

In terms of basic and applied research on medical and dental themes, Tokyo Medical and Dental University (TMDU) is a prominent institution. TMDU is a science-based public university, highly regarded by the quality of the research articles and its Academia-Industry collaboration initiatives. The main companies working with TMDU are Fujitsu, Sony, Ricoh, Nippon Zoki Pharma, among others.

Regarding the compensation system for inventors, TMDU has a slightly different scheme than UTokyo. In the case of TMDU, the income for the licensing is distributed as follows: 40% for the inventor(s), 20% for the Department and 40% for the University, once all necessary expenses are paid. Additionally, inventors are granted Y30,000 per patent application, and Y20,000 per design registration.

**Table 10.** Overview of domestic patent applications by TMDU

<b>Year</b>	<b>Patents</b>	<b>Applications by TMDU only (%)</b>	<b>Joint applications with universities and research institutions (%)</b>	<b>Joint applications with companies and corporations (%)</b>
2015	41	29	22	49
2016	36	22	6	72
2017	44	39	11	50
2018	52	42	6	52
2019*	8	37	13	50

**Table 11.** Overview of foreign patent applications by TMDU

<b>Year</b>	<b>Patents</b>	<b>Applications by TMDU only (%)</b>	<b>Joint applications with universities and research institutions (%)</b>	<b>Joint applications with companies and corporations (%)</b>
2015	13	46	8	46
2016	22	32	23	45
2017	21	33	5	62
2018	33	49	6	45
2019*	1	0	100	0

\* Data is still in a preliminary stage.

#### **4.2.3 Merits of the PCT for Universities**

As regards as the benefits of the PCT system for Universities, UTokyo utilizes the PCT system to protect University's technologies overseas. The protection allows UTokyo

to license the technologies to existing organizations or startups. Mr. Yamamoto explained that “UTokyo is focusing on overseas patent applications”.

He further commented that:

*In many cases, our licensees are Japanese companies but when the Japanese company wants to go to the US market or the Chinese market, they need the US patent application or Chinese patent application. So that's why we need to file patent applications in overseas countries.*

As UTokyo is not always able to develop products on its own, Mr. Yamamoto explained that the University seeks first to file a patent application, and then starts marketing and licensing efforts. In this dynamic, the PCT has proven very useful. The PCT provides enough time to find Japanese partners and, if there is no interest from them, to seek international partners to commercialize inventions.

### **“Success stories” of PCT utilization**

When asked about a “successful case” of PCT utilization for the TLO of UTokyo, Mr. Yamamoto cited Vedanta Bioscience. Mr. Yamamoto described the case:

*We got the invention disclosure from inventors in 2009 and in that time, unfortunately, there was no interest. We introduced this technology to all of Japanese pharmaceutical companies, because we have a very strong relationship with pharmaceutical companies. Unfortunately, they were not interested. In that case, we had to choose between abandoning the patent application or negotiating with a foreign company.*

*In that time, a US venture capital was very interested in starting a startup company, but that venture capital was located in Boston. They asked us if the Utokyo would establish a startup company in the US. It's too easy for them to invest in this startup if it's located there.*

*Vedanta Bioscience succeeded in sublicensing the technology to Janssen pharma and Johnson and Johnson Innovations. The conditions for the sublicensing were 241 million US dollars. It's very huge case.*

*If we didn't have the PCT application system, maybe we would have abandoned the patent application. We filed the PCT patent application and we had one and a half years after the PCT patent applications to negotiate. In total, we have 2 and half years to negotiate with the potential licensee, so that's enough for us.*

In conclusion, Mr. Yamamoto summarized one of the benefits of the PCT as “getting enough negotiation times”.

From Tokyo Medical and Dental University (TMDU), Mr. Watanabe (Head, Patent Attorney, Institute of Research Division for Research Innovation, Research Center for Industry Alliances) also agreed with the fact that filing a PCT patent provides ample time to find potential partners interested in the technology.

Mr. Watanabe asserted that “PCT is a good system for applications to be effective in multiple countries”. And he added: “If you’re filing patents for more than 3 countries, probably the PCT is the most recommended route”.

Additionally, Mr. Naoyuki Morisaki (Institute of Research Division for Research Innovation, Research Center for Industry Alliances) argued that “Once we file the patent application (via PCT), we have time to research in which way we can utilize the invention”.

Further merits of the PCT system for Universities were described by Mr. Teruhisa Shimomichi (Former patent examiner, Director of Patent Information Planning Division at JPO, Director of Video Equipment Examination, and member of PCT Administration Department at WIPO):

*In general, Japanese Universities do not have enough money (I think this may be the case in Argentina also) for filing patent applications in a plurality of countries. When an applicant does not use the PCT, the applicant has to pay following fees: (a) Filing fee for each Patent Office, (b) Search fee for each Patent Office and (c) Translation fee for each Patent Office.*

*However, when the applicant uses the PCT, the applicant is required to pay one filing fee (International Filing Fee for the WIPO International Bureau), and a search fee (International Search Fee for ISA).*

*Further, translation is not necessary until an international application enters into the national phase, that is, within 30 months from the priority date. Therefore, at the international phase, the applicant may pay fee only one international filing fee and one search fee.*

To summarize, PCT optimizes costs for patent filings, and differs costs of international filings and translations until they are required to enter the national phases on the designated countries. This provides Universities enough time to find partners willing to share the costs of patenting overseas.

#### **4.2.4 PCT system as a source of Patent Information**

In relation to PCT system utilization by Japanese universities, one of the topics of interest was if they utilized Patentscope as a source of Patent Information. The topic is relevant because the possibility to access not only patent information and complete documents, but because the database allows accessing International Search Reports (ISRs) and other related information.



In the case of TMDU, Mr. Watanabe noted that Patentscope is only utilized for downloading Patents File Wrappers (also known as “dossiers”). When asked if TMDU relied on Patentscope for patent information, Mr. Watanabe expressed that the University relied in other databases for such purposes. Nevertheless, Mr. Watanabe explained that Patentscope is mostly utilized by private companies.

Mr. Morisaki expressed that, in order to conduct patent information research, they utilized JPO database or Espacenet (from the European Patent Office).

#### **4.2.5 Awareness and promotion of the PC**

An additional topic of interest for the present work was how Japanese universities foster an IP Culture, and what activities they perform to increase awareness and promotion of the IP system and the PCT system in particular.

In UTokyo, main activities to improve awareness and promotion include education, mentoring and consulting on IP issues conducted by several offices of the University, such as Todai TLO and the Office of Innovation and Entrepreneurship. UTokyo also provides venture funding and incubation for startups.

As commented by interviewees, “Success stories” are also important for improving education on IP. Advertising “success stories” serves many purposes. On one hand, the university community learns that UTokyo fosters IP and takes care of the exploitation of the IP created by its members.

As explained by Mr. Kagami during the JPO/IPR Training Course on “Academia-Industry Collaboration and Technology Transfer”, PeptiDream was one of the most “successful stories” from UTokyo. Mr. Yamamoto also agreed on this topic about PeptiDream, and he provided more information regarding PCT:

*Peptidream is the most successful startup company in Japan. It is focusing on peptide technologies. They have over 1 trillion peptide libraries. Many big pharmaceutical companies like Novartis, Sanofi, Bayer, Amgen, Genentech collaborate with this company. (...) So, if we didn't have our PCT applications, it's a little tough to cover such big pharmaceutical companies in the world”.*

In order to encourage the next generation of successful university startups, UTokyo offers many programs and incentives. One of them is “gap funding”, a special contribution of up to USD 60,000 for a research project to build a “proof of concept”.

Both Prof. Kagami and Mr. Yamamoto expressed that young researchers are eager to commercialize their technologies and fund their own startups.

In the case of Tokyo Medical and Dental University (TMDU), Mr. Watanabe and Mr. Morisaki explained that the University doesn't have a university-wide initiative to raise awareness on IP matters.

Instead, consultation and mentoring about IP issues usually take place on a one-on-one basis with faculty members and researchers. The IP office of TMDU usually receives consultations from researchers willing to protect their technologies via a patent application.

It's also important to note that although the IP awareness and promotion at TMDU is high, Mr. Watanabe and Mr. Morisaki agreed that there is work to be done. "That will be our challenge in the coming years", said Mr. Morisaki.

### **4.3 Japanese Companies and the PCT**

Private companies are the primary users of the PCT system in Japan by the number of patent applications. As has been observed in Chapter 2, companies like Mitsubishi, Panasonic, Sony, Sharp, Fujifilm, Hitachi, Sony and Fujitsu are the top applicants in Japan and they are also top applicants worldwide.

In order to gain a first-hand insight on PCT utilization by the companies, two meetings were held with members of the International Affairs Committee (2019) and Pharmaceuticals and Biotechnology Committee (2019) of the Japan Intellectual Property Association (JIPA).

The topics of discussion of the two meetings were PCT utilization, awareness and promotion, and the PCT as a source for patent information for private companies in Japan. Each JIPA member shared their impressions on the PCT, and how their companies implemented IP strategies to take advantage of the Treaty's features.

#### **4.3.1 Merits of the PCT system**

On the question whether the Japanese companies found the PCT useful for their operations, all participants of the meetings agreed on the affirmative. Their companies,

many of them having a global presence, utilized the Treaty as a usual practice, and many of the companies had vast experiences filing for patents via the PCT route.

The majority of participants argued that filing for patents in multiple countries is simpler via PCT, compared to the Paris Convention route.

As with the case of Universities, private companies considered that one of the main benefits of the PCT is the increased time frame in which applicants have to make decisions regarding their application.

A member of a company stated that: “In my company we use the PCT because of the time period we had to decide in which countries we should file the patent. In case of the PCT we have 30 months to consider which countries we should go”.

A member of another major company added that: “We can postpone the time and costs of translations of the patent applications”.

Referring to translation’s costs, the majority of the interviewees agreed that the cost of translations make the bulk of the international patent filing expenditures.

Another benefit of the PCT for the companies is the possibility to file a patent application in their own Patent Office, in their own language. Some interviewees agreed with this point. The Japanese language is one of the accepted publication languages under the PCT alongside Arabic, Chinese, English, French, German, Korean, Portuguese, Russian and Spanish.

#### **4.3.2 The cases of innovative pharmaceuticals and biotech companies**

A member of a global pharmaceutical company gave a thorough explanation of the merits of the PCT and its IP management strategies. From the perspective of his company, the main benefit of the PCT is the ability to file for patents in a plurality of countries.

Furthermore, the PCT has additional benefits in terms of IP management and business. In the pharmaceutical and biotech sector, new developments have a degree of uncertainty because, on one hand, they take a long time, and in the other hand, the success rate is low. In this scenario of uncertainty, adequate protection for new developments via patents is a requisite.

By utilizing the PCT, companies have enough time to decide in which countries to seek protection in. Companies can delay the decision until they have some degree of certainty about the success of the product or technology.

Likewise, when companies file via PCT, they have ample time to analyze the value of the patent and the value of the business before incurring in translation costs and other expenditures needed for international protection.

#### **4.3.3 PCT utilization as part of the IP strategy**

When asked about the frequency of PCT utilization versus Paris route applications, the majority of the companies agreed that they filed almost always PCT applications when filing for patents abroad. Some of them apply for the patent first in Japan, and then via PCT claiming priority to the Japanese patent.

Some company representatives asserted that they file the majority of their international patents via PCT route, except for the cases of countries outside the PCT system (Argentina, Taiwan and others).

A few representatives commented that Argentina is an attractive market, and that they would probably file for patents in greater numbers, should the country access the PCT in the future.

#### **“Success stories” of PCT utilization**

Regarding “successful” examples of PCT patent applications by the private companies, three examples were mentioned by the interviewees.

Article 19 of the PCT (Amendment of the Claims) proved useful for some of the companies. In such instance, the ISR provided timely information and they are able to circumvent prior art documents by modifying the claims of the application.

A positive ISR meant for some companies the possibility to make use of the Patent Prosecution Highway (PPH) in order to file for patents globally. Other representatives commented that a positive ISR meant they could file for additional patents in the near future.

Some companies considered a “success” of the PCT system that they were able to abandon applications before incurring in filing and translation costs. This can happen when the patent is filed and then the research project abandoned. The ample time frame provided by the PCT route allowed some companies to make suitable decisions and abandon applications which are no longer being developed.

#### **4.3.4 PCT system as a source of Patent Information**

The majority of the members of companies agreed that the PCT has been useful and beneficial for them. When asked about the usefulness of the International Search Reports (ISRs) and Written Opinions (WOs), almost every interviewee agreed that they found them useful.

Examples of ISR and WO utilization in their activities include: to confirm evaluation on patentability performed in-house, and to determine in which countries to enter national phase and analyze translation costs.

As stated in the previous section, some companies take advantage of the ISR by modifying or restricting the claims of the application based on the prior art documents.

#### **4.3.5 Awareness and promotion of the PCT**

On the topic of awareness and promotion of the PCT system, the majority of the interviewees agreed that the Treaty is already well known among the private companies. As has been described in the previous sections, private companies in Japan utilize the PCT very frequently, and the utilization of the PCT is increasing year over year.

They gave recognition to the activities being carried out by the Japan Patent Office (JPO) in order to increase awareness among Japanese applicants about the PCT. On this topic, they highlighted the seminars and the trainings provided by JPO. Additionally, they also mentioned that the World Intellectual Property Organization (WIPO) provides training about the PCT.

On the topic about universities and PCT awareness, many interviewees commented that it's important that for Argentina to access the Treaty. This will allow companies to invest in joint research projects with Argentinean universities, because with a PCT application they will have more time to make decisions and to seek protection in other countries.

## 4.4 Insights from PCT experts in Japan and WIPO

In order to deepen the understanding about the merits of the PCT system, the next section of the work will focus on interviews with PCT experts. Interviews include officials of Japan Patent Office (JPO) and World Intellectual Property Organization (WIPO).

### 4.4.1 Merits of the PCT system

As regards as benefits of the PCT system for domestic applicants, Mr. Teruhisa Shimomichi (Former patent examiner, Director of Patent Information Planning Division at JPO, Director of Video Equipment Examination, and member of PCT Administration Department at WIPO) described that:

*The most important benefit of the PCT System is that, when an applicant wishes to file a patent application for an invention in a plurality of foreign countries, a single patent application may be filed under the PCT (the International Application) in one language with a single patent Office (Receiving Office).*

*If the international application fulfills the prescribed requirements, the RO accord the international filing date and the accorded international application has the effect of a regular national application in each designated States (all PCT Contracting States) as of the international filing date, which date is considered to be the actual filing date in each designated State.*

The benefit of having to file only one patent application, in one language, with a single Patent Office is highly regarded by the majority of the interviewees. As mentioned in the previous section, the Japanese language is one of the publication languages under the PCT, which is a significant benefit for Japanese applicants.

Another useful feature of the PCT is that there's only one Formality Examination carried out by the Receiving Office. This means that if a patent application successfully overcomes such examination, the Patent Offices which receive the application in the National Phase will have that part of the examination already completed. In this way, the workload of the Patent Offices is reduced.

For the applicants, the PCT system provides the International Search Reports (ISR) and the Written Opinion (WO). These documents are elaborated by professional examiners from the Patent Office which was chosen as the International Searching Authority (ISA), and they provide information about whether or not the invention meets patentability requirements (novelty, inventive step and industrial applicability).

Mr. Shimomichi explained that:

*If the relevant prior art cited in the ISR could refuse novelty or inventive step of the invention, and the opinion of the WO/ISA is negative, the applicant may decide to discontinue the application and not enter the national phase. In such a case, the applicant may save money for translation fee, official fee to pay the designated office (...) Nevertheless, if the ISR is negative, the applicant may amend the claims and continue with the application in the national phase.*

#### **4.4.2 The PCT system and developing countries**

Mr. Rolando Hernández-Vigaud is the Head of Offices Services Section at the PCT International Cooperation Division of WIPO. The Offices of Services Section carries out development and implementation of cooperation activities both with PCT member states and with states considering accessing the PCT.

In this regard, Mr. Hernández-Vigaud explained that the PCT is especially beneficial for developing countries:

*Taking into account the nature of the PCT system, the main benefit for developing countries is to make available to applicants of the national industry, of universities, an instrument that allows you to seek protection abroad easily in a more economical way, more rational, and above all safer from a technical point of view. That's the greatest advantage of the system.*

Furthermore, accessing the PCT allows access to related information services provided by WIPO, which benefits applicants and Patent Offices of the contracting states.

Reflecting on the importance of the PCT system for developing countries, one of JPO officials explained that it's important for Japanese trading partners to be part of the PCT, in order to protect the IP of Japanese companies overseas.

One of JPO officials referred to the example of Thailand, which accessed the PCT in 2008. Japanese companies were interested in Thailand accessing the Treaty because the country is an important trading partner. Although there was some local opposition to the PCT, the JPO provided information and training in order to clarify some misunderstandings regarding the PCT system.

One of JPO officials commented that the PCT is a procedures Treaty and not a mechanism for granting of rights per se. He explained that is important to try to clarify the issue and explain how joining the PCT will mean advantages for both developing countries and developed countries.

As statistics provided by One of JPO officials show, Japanese patent applications in Thailand and Thai patent applications in Japan via PCT are increasing year over year. One example is Thailand's Chiang Mai University, which files for patents in Japan.

Regarding the outlook on investments and technology transfer, one JPO official mentioned that private companies usually prioritize the filing of applications in countries where PCT is available.

The PCT route allows companies up to 30 months to decide in which countries they will protect their inventions. However, if a country is not a PCT contracting state, companies must decide before 12 months if they will file for the patent in that country. This situation places non-PCT countries at a disadvantage.

One JPO official considered that, if Argentina accedes the PCT, there could be an increase in foreign trade and investments.

The perspective of the JPO experts is that accessing the PCT will also improve research, Open Innovation, Joint Ventures and Academia-Industry collaborations, both domestically as well as internationally. They stated that the PCT route offers an easy and convenient pathway to obtain patent rights for the result of research activities.

One of JPO officials shared the document "From Horizon 2020 to Horizon Europe" (European Commission 2020), which exemplified that the PCT "promotes innovation" among contracting states.

Lastly, PCT experts have been asked if they considered that accessing the PCT meant losing sovereignty and independence for the signing country. In complete agreement, they argued that accessing the PCT won't mean losing sovereignty or independence.

In reference to this question, Mr. Hernández-Vigaud explained that:

*It has to be taken into account that the PCT has a limited scope. This is a procedural treaty, and not a substantial treaty (...) From a substantive point of view, the question of the PCT affecting national industries is going to depend, not on the PCT itself, but on the national patent legislation.*

The main reason is that the Treaty does not force the signing country to change its IP laws. On the other hand, utilizing search reports prepared by other offices for the examination process does not mean that the signing country must not judge the invention by its own criteria, laws and regulations.

This characteristic is clearly stated on the Treaty itself (27.5):

*Nothing in this Treaty and the Regulations is intended to be construed as prescribing anything that would limit the freedom of each Contracting State to*



*prescribe such substantive conditions of patentability as it desires. In particular, any provision in this Treaty and the Regulations concerning the definition of prior art is exclusively for the purposes of the international procedure and, consequently, any Contracting State is free to apply, when determining the patentability of an invention claimed in an international application, the criteria of its national law in respect of prior art and other conditions of patentability not constituting requirements as to the form and contents of applications.*

#### **4.4.3 PCT as a source of Patent Information**

As with Universities and companies, the experts on the PCT were asked their opinions about the PCT being a useful source of Patent Information. The interviewees agreed that the Treaty provides applicants and the Patent Offices of the contracting states with useful information and in a timely manner.

Mr. Shimomichi explained that, as a matter of course, examiners of the PCT-participating offices look into the International Search Reports (ISRs) and Written Opinions (WOs) for useful prior art documents. “However”, he commented “if the examiners believe that the invention is likely not novel or does not involve inventive step, the examiners will search prior art of the invention by themselves”.

Furthermore, there is a varying degree of reliability between the Patent Offices, as every International Searching Authority (ISA) has different capabilities and human resources, and no every ISA is capable of covering 100% of the available prior art. In this regard, Mr. Shimomichi said: “Every Industrial Property Office relies on the ISR, but how strongly each office relies on the ISR is different from country to country”.

Mr. Shimomichi also described the ways in which the PCT provides diffusion of knowledge. For instance, Patentscope provides information to third parties about competitors and their technologies. Secondly, Patentscope allows the user to observe the legal status of the applications, and in which countries did the patent enter the national phase.

Mr. Hernández-Vigaud (PCT International Cooperation Division, WIPO) provided insights about the important topic of specialized knowledge in the framework of the PCT. Usually commercial patent databases which contain, for example, chemical formulations, are too expensive for applicants in developing countries.

“However”, Mr. Hernández-Vigaud explained, “the information that the applicant receives with the ISR and WO comes from these specialized databases, as examiners have

access to them. That's definitely a plus, which the applicant cannot access in any other way". He commented that applicants appreciate such reports.

On the other hand, Patentscope offers applicants the option to display information about licensing of their inventions. This feature provides a worldwide link between inventors and third parties interested in acquiring a license for their technologies.

Mr. Hernández-Vigaud explained that being able to display licensing opportunities are important for small and medium sized enterprises (SMEs) because they lack the means to participate in worldwide technology trade. "However", he commented, "in Patentscope they have a kind of 'showcase' to show themselves to the world".

Mr. Hernández-Vigaud also agreed that the Patent Offices benefit greatly from the PCT products to expedite patent examinations. "(...) Most of all the PCT is a tool for international integration of the intellectual property systems in the field of patents, hence every integration is beneficial to the Patent Offices".

#### **4.4.4 Awareness and promotion of the PCT**

On the topic of awareness and promotion of the PCT, Mr. Hernández-Vigaud referred to two "success stories" from Latin America. He considered that Chile and Peru, which accessed PCT in 2009, are two good examples of PCT consciousness and utilization.

Mr. Hernández-Vigaud explained that:

*This year both Chile and Peru turned 10 years within the PCT. In a few years the Chilean PO (INAPI) became an International Search Authority (ISA) and an International Preliminary Examination Authority (IPEA). It's quite successfully utilized by Latin America applicants.*

*Above all, the applicants have received very well possibility of utilizing the system and if we see the statistics of Chile, for example the most active applicants are precisely the Universities, where a lot of knowledge is created.*

He mentioned also the case of Peru, which he considered successful on a different scale, and that statistics show that the PCT is being utilized more and more every year. Universities are also the top applicants in that country.

Among other examples he named China, which is the N°2 PCT patent filer in the world, and Cuba, which utilizes the PCT for the internationalization of R&D results.

As regards as good examples of PCT utilization and promotion by Universities, One of JPO officials commented that the University of California (UC) and the

Massachusetts Institute of Technology (MIT) led the rankings for many years, but they will probably be overtaken by Chinese universities in the near future.

In order to improve awareness and promotion of the PCT, Mr. Hernández-Vigaud mentioned “the necessity for promoting the patent system, for promoting its utilization and in that regard, to promote the use of the PCT”. He considered that this effort should involve education on IP matters, especially at the universities, and it must include IP rights in a general sense.

Regarding activities which can be performed on the universities, he recommended adding IP issues on the curriculum of diverse careers, promoting the creation of Technology Transfer Offices (TTOs) and the implementation of IP policies geared towards protection of research results and their publication. Lastly, he recommended improving Academia-Industry collaboration for conducting R&D activities. He stated that: “The objective is to ‘land’ science in reality”.

Mr. Hernández-Vigaud and his team organize activities on countries which have accessed the PCT, and also on countries considering doing so. He said that: “Typically we conduct seminars and workshops. We do very particular work with the Patent Offices to increase their training level. We also work with applicants, and also with IP Agents.” They also provide technical assistance on PCT-related platforms and capacity building activities.

JPO’s International Cooperation Division also provides support for applicants and governments, having conducted several seminars and meetings in many countries.

In terms of increasing awareness of the PCT by the government, one of JPO officials highlighted the importance of a dissemination campaign implemented by the government, aimed at the general public and in many cities around the country.

One of JPO officials commented that, due to costs, some SMEs may consider the PCT route is not feasible route for them. To circumvent such problem, the government should implement measures like subsidies to support PCT applications by these applicants.

## **4.5 Summary of Results and Analysis**

So far, two main activities have been conducted in the present work: an analysis of PCT utilization, awareness and promotion by universities and private companies in Japan, and the review of several interviews with PCT experts from JPO and WIPO.

Having analyzed the longstanding experience of Japan with PCT operations, the main finding of the study is that the PCT is an invaluable tool for promoting innovation among domestic applicants seeking protection overseas, and for fostering international trade and technology transfer.

In a way, PCT utilization is a key element on a wider and encompassing national policy by Japan, in which authorities recognize that creating, protecting and exploiting Intellectual Property is crucial for the economic growth of the country.

Such policies aim at internationalization of IP, improving competitiveness of industries, increasing science and technology education, among others. In this context, trade agreements and IP harmonization treaties such as the PCT play a significant role.

## **4.6 Summary of advantages of the PCT**

Having analyzed the PCT experiences from the point of view of diverse organizations, and the opinion of PCT experts, the summary of the advantages of accessing PCT can be described as follows:

### **Advantages for Applicants**

- Reduced costs for patent filing in multiple countries.
- Simpler patent filing procedure.
- One application, in one language, before one Receiving Office (RO).
- Time limit of up to 30 months:
  - To decide entering national phases.
  - To defer payment of patent fees and translation expenditures.
- Relevant information about the invention in a speedy manner:
  - International Search Report (ISR) / Written Opinion (WO).
  - International Preliminary Examination Report (IPER)

- Possibility to make adjustments to patent application:
  - Claims of application (during ISR/WO phase).
  - Claims, descriptions and drawings of application (during IPER phase)
- One formal examination before entering National Phases.

### **Advantages for Patent Offices**

- Reduced redundant work regarding formality examination of application.
- Reduced redundant work regarding prior art searching.
- Access to PCT-related services.
- Possibility to collaborate between Offices and WIPO.

## **4.7 Summary of negative aspects of the PCT**

The analysis of PCT utilization by Japanese applicants and the opinions of PCT experts also served the purpose of compiling several aspects of the Treaty that are considered negative.

### **Negative aspects for applicants**

- There's an additional fee for the International Filing of the patent.
- Some consider that filing via PCT should be more affordable.
- There are still countries that are not in PCT.

### **Negative aspects for the Patent Offices**

- Increased workload due to increased incoming patent applications.

## 5. Implications and recommendations

The Patent Cooperation Treaty (PCT) has proven very useful for applicants from Japan, since the country accessed the Treaty in 1978. Major users of the PCT system include the private companies, and also universities which decide to file for patents overseas via the PCT route.

Applicants from Argentina, on contrast, are being left out of the advantages of utilizing the PCT system. As long as the Argentinian authorities and legislators refuse to access the Treaty, Argentinian applicants will continue to be at a disadvantage against foreign applicants.

By analyzing available information, three reasons for the situation are suggested:

1. Lack of a national strategy to leverage IP.
2. Misconceptions about the PCT.
3. Opposition from some domestic pharmaceuticals.

It's important to note that Argentina should access the PCT taking into account the current situation of the country. Top-level political decisions and new policies have to be implemented in order to convince applicants and companies who oppose accessing the Treaty, and to make full use of the PCT system for the benefit of the country.

In other words, the accession to the PCT by Argentina should be considered in the developing context that Argentina is currently in.

### 5.1 Ideas for a national IP strategy

The new national IP strategy in Argentina should, ideally, follow Japan's example: focus on domestic capacity building in order to promote internationalization of IP, and to foster international integration and trade.

In order to address the local opposition to the PCT, Argentinian legislators should be able to reach a "middle ground" between domestic pharmaceuticals and the need to access the PCT by innovative sectors which are at a disadvantage without the PCT.

New initiatives should be in place, such as subsidies for domestic applicants who seek to utilize the PCT for filing for patents overseas and international collaboration activities.

## **5.2 Addressing misconceptions about the PCT**

In order to improve awareness about the PCT in Argentina, myths and misconceptions about the Treaty must be addressed in a clear and understandable manner. Clarifying the topics that are misunderstood will allow the public debate to take place based on valid information. And valid information, in turn, will mean making better, informed decisions.

The PCT has been very useful to Japanese applicants as a facilitator for innovation, and as a platform for patent internationalization. Although it is true that Japan is a developed country, developing countries can take advantage of the PCT to “catch up” and promote domestic innovation and growth.

It’s also simply not true that accessing the PCT will mean that Argentina will have to change its national IP laws and regulations, or make the examination process more lax. Accessing the PCT will mean that Argentina will be able to share search reports by foreign offices, and that’s a positive feature.

## **5.3 Counterarguments to the opposition of domestic pharmaceuticals**

### **Argument 1: The PCT will flood the Patent Office with foreign applications.**

Counterargument: International applications coming from foreign countries make for the majority of patents in the Argentinian Patent Office already. For the year 2018, statistics on the topic show that 87% (3.242) are international applications and 13% (425) are domestic applications.

However, this is not a bad nor a good thing in itself, as it is the “expected” situation for a developing country such as Argentina. For example, Brazil has 75% (19.877) vs. 25% (4.980), Chile: 85% (2.694) vs. 15% vs. (406) and Mexico 90% (14.869) vs. 10% (1.555).

The crucial point on the debate should be, how can Argentina improve and increase patent applications by domestic applicants, which are in a steady decline?

### **Argument 2: Foreign pharmaceuticals will block domestic innovation.**

Counterargument: If Argentina should access the PCT, it will probably mean that more foreign pharmaceuticals will file for patents in Argentina via the PCT route. This has been the international experience of other developing countries.

However, this situation in itself should not be a roadblock for domestic innovation. The situation means that companies should adapt to the new landscape and to find the way to innovate without infringing IP rights of third parties, as companies in the PCT contracting states do as a matter of course.

**Argument 3: The Patent Office will rely too strongly on examinations by foreign Offices.**

Counterargument: Patent Offices rely on each other search reports, and that was one of the main purposes of the PCT. By sharing prior art searches, Patent Offices have reduced workloads in that sense. As the PCT experts have argued, relying on reports by other offices is not negative in itself, as the reports provide a minimum basic documentation to perform examinations.

This is especially useful for Patent Offices in developing countries, which have limited resources for conducting such reports, and may also help to reduce patent backlog. Patent Offices which receive patent applications with the search reports will perform their own search and will decide on the merits of the invention by themselves, applying local law and regulations.

The Patent Cooperation Treaty (PCT), in article N° 27 (National Requirements), clearly states:

*(5) Nothing in this Treaty and the Regulations is intended to be construed as prescribing anything that would limit the freedom of each Contracting State to prescribe such substantive conditions of patentability as it desires. In particular, any provision in this Treaty and the Regulations concerning the definition of prior art is exclusively for the purposes of the international procedure and, consequently, any Contracting State is free to apply, when determining the patentability of an invention claimed in an international application, the criteria of its national law in respect of prior art and other conditions of patentability not constituting requirements as to the form and contents of applications.*



## **5.4 Recommendations**

### **5.4.1 Recommendations for Universidad Nacional de La Plata (UNLP)**

The recommendations for Universidad Nacional de La Plata (UNLP) are based on two distinct scenarios: the current scenario, in which Argentina is not part of the PCT, and a future scenario in which Argentina is part of the PCT.

In the current scenario, in which Argentina is not part of the PCT, recommendations for UNLP include giving seminars about the significance and the advantages that the PCT provides for domestic applicants such as universities. Such seminars and collaborations will contribute to increase public awareness about the issue, hopefully clarifying the current issues which are not clear, and additionally to the development of the national IP strategy.

From the IP Office of UNLP, we have to explain that we are losing opportunities by not being part of the Treaty. Also, that joining the PCT will mean fostering innovation, participation in open innovation and international collaboration initiatives and joint ventures.

In a scenario in which Argentina joins the PCT, recommendations for UNLP include integrating the PCT into the IP strategy of the University, making full use of the system to protect research results overseas and grasp the opportunities the Treaty provides. In addition, the IP Office should deliver trainings for utilizing Patentscope as a source of patent information.

Regarding the opportunities the PCT could provide, in the study “Combining Knowledge and Capabilities across Borders and Nationalities” (Tsukada and Nagaoka, 2015, pg. 21), authors analyzed PCT application data from WIPO and US patent data and found that (...) “combining inventors across borders and across nationalities have become important in major industrialized countries, especially in sector where science is important for inventions”.

Furthermore, the authors expressed that “inventions based on such collaborations have high performances in terms of science linkage (a measure of exploiting scientific knowledge) as well as forward citations, relative to the inventions by the purely domestic team (...)”.

### **5.4.2 Recommendations for Instituto Nacional de Propiedad Industrial**

First and foremost, the Patent Office of Argentina (Instituto Nacional de la Propiedad Industrial, INPI), should contribute to the development and implementation of the national IP strategy. In this context, INPI should increase public awareness of the need to access the PCT.

In recent months, INPI authorities have carried out such activities, holding meetings with legislators and stakeholders about the importance of the PCT. One of the last meetings took place on November 2019, and the participants were inventors, entrepreneurs, companies, authorities and legislators of relevant legislative commissions.

Within the framework of the national IP strategy, two industry sectors must be taken into account: domestic generic pharmaceuticals and domestic innovative pharmaceuticals. Both industries should be supported by new policies and measures to make the transition to the PCT accession beneficial for all parties.

1. For generic pharmaceutical companies, INPI should:
  - Improve access to patent information.
  - Improve patent database:
    - Searching (ideally, add chemical searching).
    - Access to full patent documents.
    - Patent «-» Product/Company linkage.
    - Legal status of applications.
    - Licensing availability for patents.
    - Provide tools for identifying medicines on the public domain (for example, by displaying relational entries showing which patents are on the public domain and which are not).
  - Provide special training on exploitation of patents in the public domain.
  - Promote the utilization of PCT:
    - For filing overseas.
    - As a source of patent information.
2. For innovative pharmaceutical companies, INPI should:
  - Improve access to patent information.
  - Promote the utilization of PCT:
    - For filing overseas.
    - As a source of patent information.

- Promote policies to foster R&D.
- Promote policies and incentives for Industry-Academia Collaborations.

### **5.4.3 Ideas for a communication campaign**

Lastly, in order to increase awareness and promotion on the PCT in Argentina, a communication campaign should be implemented. The efforts should focus on the topics proposed in the previous sections, such as demonstrating the need for a national IP policy, to address the misconceptions about the PCT and to clarify the debate about the PCT to the stakeholders that oppose accessing the Treaty.

In this section, a brief summary of ideas to conduct such campaign are presented:

- Hold seminars, workshops and meetings.
- Conduct webinars and other online initiatives.
- Create flyers (such as “What is the PCT and Why should Argentina join?”)
- Create and promote videos and visualizations.
- Implement and share a hashtag (such as “#ArgentineInPCT”).

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# Appendixes

## **Appendix 1: Minutes of the interview to Mr. Takafumi Yamamoto - CEO & President, Todai TLO, University of Tokyo**

**Date: 1/10/2019**

**Brief introduction by Alejandro Javier Cafiero. Theme of studies and current situation regarding PCT in Argentina.**

(In the beginning of the interview, Mr. Yamamoto proceeded to make a short presentation of Todai TLO.)

At the University of Tokyo (UTokyo), when the professor or associate professor makes an invention, if they want to file a patent application, they have to describe the invention. That's an invention disclosure. And all invention disclosures come to Todai TLO. After we accept the invention disclosure, we always visit their laboratories after setting up the interview. In this interview we analyze the patentability or marketability of the invention. We also search for patent applications, and we recommend to the UTokyo whether we should file a patent application or not.

**Do you have a board of advisors to analyze the patentability of the invention?**

In the beginning of Today TLO we had our advisors. When I established our business model, in that time I established our model consulting Mr. Niels Raimers. He established the Technology Transfer Office (OTT) of Stanford University. In total he set up 4 TTOs in the US. We learned a lot from him and his friends. But now we can do by ourselves.

**How do you examine if the invention is patentable? Do you have a strategy to judge if the invention is going to be pursued by the university?**

This is our team. We have a patent attorney, but maybe the job situation is a little different from Argentina. When I started this business in Japan, I was the first person to go into this business. When I started our technology transferring business from university to industry in Japan, there were no tech transfer office universities. So that's why, in that time, most of faculty members were not interested in patent filing or establishing a startup company. It was not so hard for us to teach how to file patent applications in the university.

Last year we received over 500 invention disclosures (584...) The reason there are more patent applications than invention disclosures is that one patent is almost always also filed in US, China and European countries. For one patent in Japan we may have five in other countries. That's why total number of overseas patent applications is bigger than the number of invention disclosures.

UTokyo is focusing on overseas patent applications.

**So, UTokyo is leaned towards internationalization of IP?**

Yes. In many cases, our licensees are Japanese companies but when the Japanese company wants to go to the US market or the Chinese market, they need the US patent application or Chinese patent application. So that's why we need to file patent applications in overseas countries.



(...) Last year we got about twelve million US dollars in royalty income. This is almost the same as Oxford University royalty income. The royalty income is also increasing year by year. All Japanese Universities combined get about 30 million US dollars in royalty income.

UTokyo gets about 40% of all of Japanese Universities royalty income.

**Which do you consider are the main benefits of the PCT system?**

As you know, as a University, we cannot make a product at the University. In that case, we ask an outside patent attorney to make a patent application. We file the patent application and the patent holder is the UT.

After the filing of the patent application, we start marketing and licensing. In many cases, we approach many Japanese companies first, but sometimes there is no interest. In that case, we start to negotiate with foreign companies. After we filed a patent application in Japan, we have one year to file a PCT patent applications, and one year is enough for us to approach the Japanese companies.

Vedanta Bioscience is one case. We got the invention disclosure from inventors in 2009 and in that time, unfortunately, there was no interest. We introduced this technology to all of Japanese the pharmaceutical companies, because we have a very strong relationship with pharmaceutical companies. Unfortunately, they were not interested. In that case, we had to choose between abandoning the patent application or negotiating with a foreign company.

In that time, a US venture capital was very interested in starting a startup company, but that venture capital was located in Boston. They asked us if the UTokyo would establish a startup company in the US. It's too easy for them to invest in this startup if it's located there.

As I mentioned before, Japanese government set up the Japanese Bayh-Dole act 1999, but the Japanese Bayh-Dole act is a little bit different from the US. In the US, if the University has a research grant from the Government, the University has to negotiate with a domestic company. Preference is given to the domestic company, but we don't have such a regulation in Japan. That's why we decided to establishing a startup company in Boston.

Vedanta Bioscience succeeded in sublicensing the technology to Janssen pharma and Johnson and Johnson Innovations. The conditions for the sublicensing were 214 million US dollars. It's very huge case. The researcher lives in Japan, he stayed here.

If we didn't have the PCT application system, maybe we would have abandoned the patent application. We filed the PCT patent application and we had one and a half years after the PCT patent applications to negotiate. In total, we have 2 and half years to negotiate with the potential licensee, so that's enough for us.

That's why as regard the PCT patent application, the benefit is getting enough negotiation times.

In the case of Vedanta, the Venture Capital firm was very interested in the US market, Japanese market and European market. They applied for US patent applications and EU patent application.

**All started with the PCT system as a facilitator...**

Yes. This technology is related to international new drugs, so if the Argentine government doesn't want to join the PCT, in such case this drug will not be covered in Argentina, that won't be good for Argentina patients.

In most of our cases, we file a patent application in Japan, and then we move to the PCT patent application, this is a typical case for the UT.

**Also the Japan Patent Office (JPO) is very efficient and fast.**

Yes. Sometimes the researcher of UTokyo wants to publish next week. In that case, sometimes we use the US provisional patent application first. It's too tough for us to file a patent application within one week. After filing the US provisional patent application, then we move to the PCT. In that time, we can make a strong patent application

**That's interesting because you can modify the patent application before applying for a PCT patent, and maybe you have more certainty about the invention.**

**UTokyo has more international patent applications than domestic applications. Which are the primary reasons UTokyo chooses the PCT system for filing patents abroad?**

We have so many reasons. Even though our licensee is a Japanese company, the Japanese company wants to do business with overseas countries. For example in Brazil, US, China, so in that case they need PCT for overseas patent application.

Another reason is that overseas licensing is increasing year by year. We have so many successful licensing cases to German companies, or US companies, or European companies. That's why, especially in life science area and biotech, US companies and European companies are very interested in university technologies. We always attend bio US or bio European conferences, we always negotiate with so many US companies or European companies.

As you know, in many countries, universities technologies are very premature, very basic technologies. In the US, US startup company licenses from the University, and they brush up technologies and go to the proof-of-concept or Phase 1 or Phase 2 of Technology Readiness Level (TRL) and then a big pharmaceutical company buys this company or sublicenses the technologies.

That's why it becomes some sort of ecosystem from university technology to the big companies. The number of biotech startup companies in Japan is increasing, but the total number of biotech start-up companies is very small, compared with the US.

In many cases, the US startup or Small or Medium Enterprises (SMEs) are very interested in using our technologies. We have to file overseas patent applications.

The third reason is that in UTokyo so many professors or students are eager to establish his or her own startup company now. There are 27 or 28 startup companies located in the incubator in the next building. UTokyo established a brand new incubator in February, but this second of incubators is full now. So UTokyo established a third incubator in Kashiwa Campus.

Last year we founded 30 new startup companies. Nowadays many students and professors want to establish a startup company. In many cases we've had to file a patent application if he is a professor at UTokyo and wants to establish his own startup company. The strategy of filing a patent application for the startup company is not the same as the filing of a patent application for the university. In that case we have to discuss about what kind of business he wants to do, the competitors of his company, the market of his business.

Japanese startup companies is not only focusing on the Japanese market, but also overseas market because Japanese market is still strong, but the numbers of population will decrease in the future. So the companies must focus on the overseas market.

**And what happens with independent further developments? If the startup is using licensed knowledge, or a licensed patent, and they develop the technology further... Do they file a patent on their own? Or do they have to ask the UTokyo to file a patent application?**

In many cases, the startup company cannot hire a patent professional, so we file a patent application and then license it to the startup. It's a very convenient system from the viewpoint of the startup companies. We have to move to the PCT patent application within one year. The PCT patent application is very important for the universities and for the companies.

**I think the Japanese government was very intelligent in joining the PCT, because it's a facilitator. The government is providing the tools for the companies to interact, the universities to interact easily and cost-effectively.**

Yes, and I want to show you another case. Peptidream is the most successful startup company in Japan. It is focusing on peptide technologies. They have over 1 trillion peptide libraries. Many big pharmaceutical companies like Novartis, Sanofi, Bayer, Amgen, Genentech collaborate with this company.

We received the first invention disclosure from Prof. Suga in 2005 and we recommended him to establish a startup company. He agreed. The company was established in 2006 and then after seven years this company has succeeded in an Initial Public Offering (IPO).

The first year, they didn't have a business model. We discussed about their business model with the Professor and the president of this company (Mr. Kubota), and then we discussed what kind of businesses are suitable for this company and how do we commercialize these technologies to overseas markets.

So, if we didn't have our PCT applications, it's a little tough to cover such big pharmaceutical companies in the world".

**Peptidream is a very successful "success story".**

Yes. Two years ago, the price of this company's stock was the one which showed greater increase of the Japanese listed companies. Market capitalization of this company is bigger than Sharp. This company is building a new head office nearby Haneda Airport.

That's why we discuss with professors how to cover overseas market. How to cover the overseas market is almost equal to how to file overseas patent applications. Of course we always suggest the professor of the startup company to file an Indian patent application, US patent application, or sometimes other countries.

**At first you look for companies in Japan and overseas which can be interested in the technology... And then you analyze where to file the patent application?**

Yes, that's why we have to make a decision within one year. As you know, the speed is most important for our business. Four or five years ago UTokyo studied our activities and we had 100 licensing agreement. 51 percent of the licenses were done within one year after we filed a patent application, so that's why speed is the most important for our business.

After we file a patent application in Japan and if we succeeded to license our technology to Japanese company within half a year, in that case this company can choose which countries they file that patent application.

Most University inventions are premature, so in many cases we choose to file the PCT application, and after we filed the patent application and license our technology to the company, the company chooses the PCT system.

**Do you have to wait until the patent is granted to provide the license to the company?**

We don't want to wait until the patent is granted. Of course, the Japan Industrial Property Office is very efficient. We don't worry about a patent application becoming a patent or not.

**But you have a degree of certainty that the patent is going to be granted...**

We delegate the pattern drafting to another patent attorney or an outside assistant. The TLO generally drafts license agreements, and UTokyo checks the agreement. The head of the UTokyo patent department is a lawyer. And she is a specialized in IP rights.

**What are the main benefits of having a TLO separated from the University (external TLO) as regards patent management? Do you believe that Universities in developing countries should implement a similar model?**

To be frank, Japanese universities are bureaucratic and slow to make decisions. In many cases, university staff moves every two years or every three years. Know-how and skills cannot be retained.

In the US, Rita Nelson has been director of TLO over 20 years, many people know her. So, if you want to negotiate with a Japanese company or overseas company, if our member moved to another office every two or three years, in that case know-how or skills are lost.

Our team is very unique because we have salesmen and a very diverse group. We don't worry if he or she is a graduate student of the University. Most of our colleagues are not UTokyo graduates, including me. We don't worry about which university he or she is a graduate from. UTokyo has an Intellectual Property Department; most of them are graduates from the UT.

We need a permanent structure. When we want to hire a new person, it's very easy for us. There are over 1000 people who applied to our company. Nowadays this businesses getting popular.

**In Argentina the TLO is part of the University, so maybe the members of the TLO don't have incentives to move quickly and efficiently.**

Yes, of course, we have an incentive system in our company. To be frank, the culture of our office is very different from the culture of UT. The group manager can make decision whether we should file for a patent application and whether we should move to the PCT or not, and which company we should negotiate with, setting of exclusive or non-exclusive licenses, and so on.

**It's a decentralized decision-making process...**

Yes, and we also encourage private conversations.

**Do you think that having a private TLO is a model Universities in developing countries should pursue?**

As I mentioned I was the first person to in this business in Japan. In that time, most of the University people thought that I was crazy, because most of our Universities were not interested in their patent filing or University-Industry collaborations. I visited a private university, one of the top-ranking Universities, they said to me not to speak about "royalties" or "stock options", they were dirty words. They were not interested. But nowadays they changed tremendously.

Nowadays, when professors prepare the presentations, they always mention how their technology collaborated with industry. Now many professors are eager to file patent applications. That's why I believe that, in the developing countries, the independent TLO office will succeed.

In the UK, Oxford University has "Oxford University Innovations"; it's the same as us, 100% subsidiary of Oxford University. So historically they had an Intellectual Property Department within the University, but they separated to work as a subsidiary.

There are so many reasons for this. Aspiring for a profitable business from the University, it has a very good meaning.

New Mexico University has another independent tech transfer company. Miss Lisa Kuuttila is the president of this company. She worked for Stanford University first and then she moved to five universities and finally she decided to establish independent tech transfer office in New Mexico University. She mentioned to me that independence is very important

**How can Universities raise awareness in the public sphere of the importance of IP and specifically the importance of accessing the PCT?**

We always do campaigns and also lectures to professors. We always talk about the importance of patent applications and importance of University-Industry Collaborations.

The most important thing is the “success stories”. As I mentioned before about Pep-tiDream or Vedanta Biosciences. We have had so many successful cases of commercialization. Not only startup companies, but also licensing cases.

The news of the success stories is very important especially for the young researchers. The young researchers are very interested in how to commercialize their technologies. Shaft is the name of startup company in the US. Students established the startup, and they won a gap fund contest. And then Google bought this company.

When they succeed in commercializing their technology, everybody easily understands the importance of the patent application. That's why many students or professors always ask us whether they should establish their own startup company or not.

This month we had 9 cases of faculty members planning to establish startup companies. We always discuss the business model, and the strategy of patent filing. Sometimes we introduce venture capital to the professor, and sometimes we also introduce potential clients.

## **Appendix 2: Minutes of the interview to Tokyo Medical and Dental University [TMDU]**

Interviewees:

Prof. Kimiyoshi Watanabe (Head, Patent Attorney, Junior Associate Professor, Institute of Research Division for Research Innovation, Research Center for Industry Alliances, Tokyo Medical and Dental University [TMDU])

Mr. Naoyuki Morisaki (Institute of Research Division for Research Innovation, Research Center for Industry Alliances Tokyo Medical and Dental University [TMDU]).

**Date: 4/10/2019**

**Brief introduction by Alejandro Cafiero. Theme of studies and current situation regarding PCT in Argentina.**

**Which do you consider are the main benefits of the PCT system?**

Watanabe: In the current administration, we use the PCT system. When we file for a patent together with a company, and a company decides to file for a PCT application, of course we will file for the patent with them.

If we are by ourselves, Japan Science and Tech Agency (JST), the JST provides the subsidies; we will get a budget enough for a patent application. Then we will go to the PCT system.

To be honest, we do not deal the PCT system, so we don't really know which are the benefits.

One thing that we can mention is that, utilizing the Paris Route, the number of companies will be limited. On the other hand, with the PCT there will be more companies available and we can save time.

Morisaki: Especially our University is a University dedicated to medical activities. Even though we file an application, I'm not sure that technology can be immediately applied to certain products. I don't think the examination will start immediately. Especially if we utilize the PCT system, we have more time.

Once we file the patent application, we have time to research in which way we can utilize the invention.

**Does the University utilize the PCT system every time you have to file for patents abroad?**

Watanabe: It depends on the company. Sometimes they choose the PCT system, and sometimes they choose the Paris Route. Probably the number of PCT is more than Paris route.

**Which lessons can be learnt from the experience of the Tokyo Medical and Dental University regarding patent management and the PCT?**

Watanabe: For us is difficult to give an answer because the PCT has been in Japan for a very long time. We do not imagine not having the PCT system. The main thing I can think of is that it's a good system for applications to be effective in multiple countries.

**From my experience here in Japan I'm seeing that PCT is a facilitator of innovation for domestic universities and companies.**

Watanabe: In the TMDU we are trying to reduce patent applications abroad, due to budget issues.

**In Argentina we also have budget issues. That's why I think joining the PCT will be a sensible decision, because the PCT allows for more affordable patent applications.**

(Description of charts of TMDU patent filing)

Watanabe: If you're filing patents for more than 3 countries, probably the PCT is the most recommended route.

Joint applications account for a half of patent applications. That's because we have started joint research with a company way before we file for a patent application. Sometimes the research is ongoing. If with find a patentable invention we will apply for a joint patent application.

**So, solo applications are made when the technology application is not clear, and the joint applications with companies are in a mature stage development?**

Watanabe: Yes, your assumption is correct. We utilize joint patent applications when the company is interested in the application of certain technology.

In this moment, we prefer to go with domestic filing. We prefer to file domestic applications. However when filing for patents abroad, examination requires us to review if that's worth doing.

The one year of the filing date, we have to analyze if that technology is going to be developed further with the company.

**From your professional experience, have you come across "success stories" of University patent applications via PCT?**

Watanabe: Sorry, unfortunately no.

**From your point of view, do you consider that the PCT patent information platform (Patentscope) plays an important role for diffusion of knowledge in your University?**

Watanabe: We don't really use that patent database that much. We may use it to download Patent File Wrapper from time to time.

As we are a University, we don't do the selling and the buying. We don't care about the third party. We only care about our own patents.

I think we utilize other patent databases, and we also get the information from our partners (companies).

**I think Patentscope is very useful in Argentina because the Industrial Property Office of Argentina can be slow for examining applications. However, with the PCT and Patentscope, applicants in Argentina can have speedier examinations.**

Watanabe: If you can visit the companies, you will see that they use Patentscope a lot. Because in Patentscope you can see who filed the patent, the result of the examination and opinions. That would be a wealth of information for companies.

Morisaki: We sometimes use the JPO patent database but we really prefer the EPO/Espacenet patent database. It's well organized and is very efficient.

**Do you carry out activities to raise awareness of the importance of IP in the University?**

Watanabe: We do not have a University wide initiative to raise awareness of IP matters. But the IP staff of the University usually talks with the researchers about IP and filing patents. We receive consultation from researchers.

Morisaki: Some researchers and professors, they have this awareness to obtain a patent. But some don't care. We are responsible for raising awareness. That will be our challenge in the coming years. We haven't handled it yet.

Last year we had an initiative of this sort, but we don't do it anymore. It's tough to say no to researchers.

**What about University startups?**

Watanabe: Four or five University professor started their own startup companies. They are not CEOs, but they started them. The plan is to license University technologies to those startups in the future.



## **Appendix 3: Minutes of the interview to Mr. Teruhisa Shimomichi**

Interviewee: Mr. Teruhisa Shimomichi - Former patent examiner, Director of Patent Information Planning Division at JPO, Director of Video Equipment Examination, and member of PCT Administration Department at WIPO.

Date: 16/10/2019

**From your point of view, which do you consider are the main benefits of the PCT system for applicants and the Industrial Property Offices?**

The most important benefit of the PCT System is that, when an applicant wishes to file a patent application for an invention in a plurality of foreign countries, a single patent application may be filed under the PCT (the International Application) in one language with a single Industrial Property Office (Receiving Office).

If the international application fulfills the prescribed requirements, the RO accord the international filing date and the accorded international application has the effect of a regular national application in each designated States (all PCT Contracting States) as of the international filing date, which date is considered to be the actual filing date in each designated States (152 States: October 16, 2019).

**The PCT introduced novel instruments, such as the International Phase and the National Phase for patent filing. Which are the advantages of such system?**

When an applicant files patent application for invention X with several foreign countries, the Industrial Property Office of each foreign countries must conduct a formality examination, carry out the prior art search and publish the patent application, for the same application with same invention X. They are overlapping work in each Industrial Property Office.

On the other hand, in the PCT International Phase, the Formality Examination is carried out by the Receiving Office and Prior Art Search is carried out by the International Searching Authority (ISA). The publication of the Patent Application is carried out by the International Bureau of the WIPO. Therefore, the workload of the Industrial Property Office is reduced.

In the National Phase, National patent law is applied. The PCT system is a patent "filing" system, not a patent "granting" system. Decision on granting patents is taken exclusively by National Offices in the National Phase.

In the national phase, patent application is examined according to the National patent law. The grant of a patent for invention in one country for a given invention does not oblige any other member country to grant a patent for the same invention.

A patent for invention cannot be refused, invalidated or otherwise terminated in any member country on the ground that a patent for the same invention has been refused or invalidated in other countries.

**Does the International Search Report (ISR) and Written Opinion (WO) help applicants decide whether to pursue patent filing and in which countries?**

Yes. The ISR cites documents of relevant prior arts and the WO/ISA provides a written opinion as to whether the claimed invention appears to be novel, to involve an inventive step, and to be industrially applicable.

If the relevant prior art cited in the ISR could refuse novelty or inventive step of the invention, and the opinion of the WO/ISA is negative, the applicant may decide to discontinue

the application and not enter the national phase. In such a case, the applicant may save money for translation fee, official fee to pay the designated office.

Nevertheless, if the ISR is negative, the applicant may amend the claims and continue with the application in the national phase.

**Regarding the WO, do you believe that statements regarding novelty, inventive step, and industrial applicability of a patent application may affect how other Industrial Property Offices examine such an application?**

Yes. When an international application enters the national phase before the designated office, for example, enters the national phase before the Japan Patent Office (JPO) as a designated office, the examiners of the JPO examine the international application with reference to the ISR and WO/ISA.

When the examiners find prior art documents in the ISR and WO/ISA which can be used for rejecting novelty or inventive step of the invention of the international application, the examiner will prepare the notice of reasons for rejection and send to the applicant.

Other case is when the examiners do not find useful prior art documents in the ISR and WO/ISA. However, if the examiners believe that the invention is likely not novel or does not involve inventive step, the examiners will search prior art of the invention by themselves.

It may depend on the ISA which elaborated the ISR, as not every ISA is completely reliable from the point of view of JPO examiners. And not every ISA covers 100% of the prior art available.

Every examiner has access to the ISR, but the examiner has to judge if the results are relevant.

Another way to find prior art documents is to refer to "Patentscope". For example, we can refer to the "Supplemental European Search Report" for the same invention for the same international application, if the applicant designated the European Industrial Property Office (EPO).

**From your point of view, do you consider that the PCT patent information platform (Patentscope) plays an important role for diffusion of knowledge, the legal status of patents, and other relevant information?**

Yes. Regarding the diffusion of knowledge, the third party may search prior arts from Patentscope when an applicant files a patent application for invention X.

The third party can also obtain information of competitor, for example on what technologies of patent application are filed, from Patentscope.

Regarding the legal status, if you are concerned with the legal status of specific international patent application, you can obtain the legal status of that application. For example, what countries the application entered into the national phase, the application was rejected or granted, or if it's pending.

**Do you consider that the PCT is an important source of patent information?**

Yes. When applicants want to obtain a patent for invention, applicants file national patent applications with their home countries. Then, they select important inventions among them, and file international applications for the selected inventions.

The filed international applications are published by the WIPO International Bureau after expiration of 18 months from the priority date. Those published international application are made available to the public. We can obtain them from Patentscope.

The published international application contains front page, claims, description and international search report.

Further, we can obtain Written Opinion (WO) of the ISA, the International Preliminary Examination Report (IPER) and other information of the published international applications from Patentscope.

(Mr. Shimomichi proceeded to give a demonstration on how to access Patentscope documents).

**Are there any negative aspects of the PCT, considering developed countries and developing countries? In which aspect can the PCT be improved?**

A negative aspect for applicants is that, comparing with the national patent application, applicants have to pay additional fee for the international phase. However, at the international phase, applicants obtain the international search report (ISR) and it gives the applicants prior art information.

Thereby, the applicants may decide whether it is worth continuing to seek protection.

**This might be useful in our case, because the examination of the patent in Argentina may take many years. Using the PCT, the examination is carried out more quickly. It's more expensive but it may be worth it.**

**Do you believe that accessing the Patent Cooperation Treaty (PCT) has had an overall positive impact in Japan?**

Yes.

**Did the PCT live up to its promises of decreasing patent backlog and redundant work in the Industrial Property Offices of the contracting states?**

Yes. I think so. The JPO reduced the patent backlog. No, the time is very short for granting patents.

**Which are the primary reasons Japanese applicants choose the PCT system over the traditional route for filing patents abroad?**

Primary reasons are as follows:

- (1) In accordance with globalization, Japanese companies have been required to obtain patents for important inventions in many foreign countries.
- (2) Before the PCT entered into force, applicants had to file a separate patent application in each of foreign countries for which patent protection is sought within 12 months (the priority period) from the filing date of the earlier filed national patent application (priority).
- (3) In this case, the applicant has to prepare documents for filing patent applications in foreign countries: in accordance with different formalities in different countries, and in different languages in different countries.
- (4) However, when an applicant wishes to file a patent application for an invention in a plurality of foreign countries, a single patent application may be filed under the PCT (the International Application) in one language with a single Industrial Property Office (Receiving, Office, RO).
- (5) If the international application fulfills the prescribed requirements, the RO accord the international filing date and the accorded international application has the effect of a regular national application in each designated state (all PCT Contracting States) as of the international filing date. The date is considered to be the actual filing date in each designated states (152 States: October 16, 2019).

**2.3. Do you believe that the PCT has been beneficial for Japanese Universities?**

Yes. In general, Japanese Universities do not have enough money (I think this may be the case in Argentina also) for filing patent applications in a plurality of countries. When an applicant does not use the PCT, the applicant has to pay following fees: (a) Filing fee for each Industrial Property Office, (b) Search fee for each Industrial Property Office and (c) Translation fee for each Industrial Property Office.

However, when the applicant uses the PCT, the applicant is required to pay one filing fee (International Filing Fee for the WIPO International Bureau), and a search fee (International Search Fee for ISA).

Further, translation is not necessary until an international application enters into the national phase, that is, within 30 months from the priority date.

Therefore, at the international phase, the applicant may pay fee only one international filing fee and one search fee.

However, Japanese Universities do not have enough money to enter the national phase, but in order to enter the national phase, the applicant has 30 months. Thus, the Universities have time to look for a co-applicant as a sponsor, often a private company.

Also, if the ISR is negative, the University will have difficulty in finding a sponsor.

**Do you consider that Japanese Universities should promote the utilization of the PCT for filing patents abroad?**

Yes. Many Universities have TLO and they should use the PCT.

**Do you believe that the PCT facilitates Open Innovation, Joint Ventures, and Academia-Industry collaborations?**

Yes. Universities and companies need patents to cooperate with each other.

**As argued by some domestic pharmaceutical companies in Argentina, do you believe that Industrial Property Offices in developing countries rely too strongly in the ISR prepared by other Offices?**

Every Industrial Property Office relies on the ISR. So, how strongly each office relies on the ISR is different from country to country. Some examiners do not rely in ISR by other Offices.

Electronics and mechanical companies usually file a great number of patents. On the other hand, pharmaceutical companies file a small number of patents, but everyone is very important. Some pharmaceuticals opt for the EPO as Searching Authority.

**Do you think that Industrial Property Offices renounce sovereignty by integrating ISR prepared by foreign Industrial Property Offices in National Phases of applications?**

Argentinian patent examiners independently decide about the patent, according to Argentinian Patent Law. The Industrial Property Offices does not renounce sovereignty.

**If the country has not accessed the Treaty, do you believe that this condition is a barrier for collaborations and technology transfer?**

Of course, yes. Argentina is not member of the PCT, and if the applicant wants to invest or establish a company in Argentina, this is a big barrier. The country is losing opportunities.

Regarding the domestic pharmaceutical sector, India has a very big generic industry and India is part of the PCT.

For example in Thailand, patent attorneys were against joining the PCT. But now Thailand is part of the PCT.

**How can Universities raise awareness in the public sphere of the importance of accessing the PCT?**

In Japan, the activities of the TLOs are not much as the United States. It just started.

In Japan, the Universities use the PCT.

## **Appendix 4: Minutes of the interview to Mr. Rolando Hernández-Vigaud**

Interviewee: Mr. Rolando Hernández-Vigaud, Head of Offices Services Section, PCT International Cooperation Division World Intellectual Property Organization,

Date: 11/05/2019

This interview was conducted through Skype video conferencing system with Spanish. This minutes is English-translated version.

### **From the perspective of developing countries, which do you consider are the main benefits for accessing the Patent Cooperation Treaty (PCT)?**

Taking into account the nature of the PCT system, the main benefit for developing countries is to make available to applicants of the national industry, of universities, an instrument that allows you to seek protection abroad easily in a more economical way, more rational, and above all safer from a technical point of view. That's the greatest advantage of the system.

The other benefit is that the PCT opens up a whole range of information services that can be used by the applicants, the Industrial Property Offices (PO), the researchers and so on.

And lastly I would to cite the importance of belonging to the system from the legal point of view. The PCT is the system upon which many developments in patent rights are based nowadays.

If you see, the Patent Law Treaty (PLT) is mainly based on the Patent Cooperation Treaty (PCT). The PCT takes the lead role in the development of any new regulation at the international level in the field of patents.

It has to be taken into account that the PCT has a limited scope. This is a procedural treaty, and not a substantial treaty. It is still important and has a relevant role in the development of international level patent law.

### **You mentioned that the PCT is safer from the technical point of view, can you elaborate?**

Normally via the Paris Convention, applicants also have access to the protection of their inventions but they have less time. Above all, they do not have the technical elements that they can be given by the International Search Report (ISR) and the Written Opinion (WO), as a minimum, to decide what to do or modify the course of the action.

The applicant has an assurance, a technical feedback regarding the merits of the invention that he is trying to protect.

### **In which way can developing countries benefit from the wide array of products and services offered by the PCT system?**

In the first place, accessing the PCT means opening the doors so that applicants can access protection abroad in the framework of this system, which is much more beneficial for them.

Secondly, a direct and privileged access to all the information services offered by the PCT.

Also, the system carries whole series of collateral tools that are not strictly PCT, but work alongside the PCT, such as the WIPO Digital Access Service (DAS). The services provides access to priority documents, it was not created as part of the PCT, but it is used mostly for PCT exchange of priority documents.

From the point of view of the Industrial Property Offices (IPOs), they can benefit greatly from the PCT products to facilitate and somehow accelerate their national examination. This is evident. But most of all the PCT is a tool for international integration of the intellectual property systems in the field of patents, hence every integration is beneficial to the Patent Offices.

**Do you believe that applicants in PCT contracting states make full use of International Search Reports (ISR) and Written Opinions (WO)?**

Yes, I believe that applicants appreciate the ISRs and WOs, and they make use of them.

In Latin America we have a lack of professionals specialized in patent drafting. This is not a problem of the PCT, it's a problem in the world of patents in general. In order to fully benefit from the results of ISRs and WOs, one of the tools is to be able to write or rewrite the application for patent in such a way that it can be successful. In that area we are lacking.

Nevertheless, applicants do use the ISRs and WOs and we see that every day. When there is a delay in the transmission, applicants are actively asking for the reports. For them, this is a very useful tool in the decision making, of what to do with that application in the future.

**This topic is very important for our countries, in which the first feedback by the POs can take years...**

Yes, that happens. But there's also the issue of specialized patent databases, which in many specific sectors are extraordinarily expensive. For example, to access to chemical formulation patent databases the memberships are too expensive.

However the information that the applicant receives with the ISRs and WOs comes from these specialized databases, as examiners have access to them. That's definitely a plus, which the applicant cannot access in any other way.

In addition, it is always good to have an expert opinion about the patent application. The search and the WO are carried out by a professional examiner.

**Do you consider that the PCT platform (Patentscope) plays an important role as a source of patent information in the case of developing countries?**

Yes, Patentscope was born to as a way of publishing international applications. It has been growing and now it not only includes international applications, but also includes national and regional collections (more than 82 million documents) of more than 50 countries.

And there are going to be more countries, as since a year ago there is an obligation for all member states to provide the International Bureau of WIPO with information on international applications that enter the national phase.

In that way, Patentscope will provide not international applications only, but also what happened at the end of the procedure when the application entered the national phase in the different countries. In some countries it may be granted, in another denied, and in others they may simply not enter at all.

This is very pertinent information for developing countries, taking into account that the database is completely free and also has very powerful search tools.

In Patentscope you can search for practically any field, that is: address, inventor name, applicant name, keywords, classification in terms of technology, etc. You can search practically for everything.

It also has built-in translation search tools, which slightly breaks the access barrier to the documentation that is not in the language of the applicant. At the moment, for example, applications from Asia are growing more clearly, which means that many applications are published Japanese, Chinese, Korean, and it is very difficult to have the translation. This is quite useful.

We have also integrated a terminology database, for searches in several languages. This is very relevant to the applicants, and it is heavily used by the applicants and even by the IPOs.

**In that sense, do you think that more human resources training are needed to be able to take advantage of this database?**

Probably yes. In the WIPO webpage you can see that we organize many webinars. We organize webinars about Patentscope in specific aspects such as chemical related inventions, information technology and so on, so applicants can make the maximum use of the database whose possibilities as I said are practically endless.

It is true that a minimum training is required to be able to exploit the database to the maximum.

**Do you believe that the PCT facilitates Open Innovation, Joint Ventures, and Academia-Industry collaborations between countries?**

As I described, PCT is purely a Treaty of procedures. I would say that, from the point of view of protection, the PCT facilitates and does not facilitates, because it's a filing system and not a granting system, there are no international patents. So it depends on how national legislation treats the applications.

From the macroeconomic point of view I would say that it facilitates Open Innovation because it facilitates the exchange of information and the access to such information. I believe that this is a very useful tool.

As regards Patentscope, it has a tool that allows applicants to announce their willingness to offer licensing agreements on that product or procedure. In fact, in the database you can optionally search only those technologies that are open to licenses agreements.

This is particularly relevant for small inventors, Small and Medium Enterprises (SMEs), so on. These are companies that do not have the power to take part in international circuits of technology trade. However in Patentscope they have a kind of "showcase" to show themselves to the world.

This also greatly facilitates international trade and international collaboration at the business level.

For example, these are also relevant for universities. Universities are where a lot of knowledge is created, but because of their historical mission, they are not necessarily going to place a factory to fabricate products. So the best way is to create knowledge and grant licenses to the companies to receive revenue of that knowledge. It's quite useful.

**From your experience, which PCT contracting states can be considered as "success stories"?**

There are several examples. I would mention two states in the Latin American region that, with different levels of development, have utilized the PCT quite a lot: Chile and Peru.

Chile is a particular example because there was a lot of opposition by patent attorneys to the PCT. Chile was during some time the center of the continental opposition to the PCT, but they finally joined. The number of applications has grown enormously, but also the Industrial Property Office has also grown thanks to the PCT in a few years.

This year both Chile and Peru turned 10 years within the PCT. In a few years the Chilean PO (INAPI) became an International Search Authority (ISA) and an International Preliminary Examination Authority (IPEA). It's quite successfully utilized by Latin America applicants.

Afterwards they have even added more working languages. They work in Spanish and in English, which is very helpful for the countries of the English-speaking Caribbean and Africa.



Above all, the applicants have received very well possibility of utilizing the system and if we see the statistics of Chile, for example the most active applicants are precisely the Universities, where a lot of knowledge is created.

The same happens in Peru, on a different scale. In Peru the number of applications is lower than in Chile, but still is having a sustained growth. It's more modest, but it's sustained. The universities are also leading the ranking of applicants in Peru.

In other regions I can give you the example of China. The first law of patents in China was approved by the 70s and today is already threatening the United States as the number one worldwide per PCT applications.

I can also cite an opposite example, the case of Cuba. Cuba is a small country that does not have many means for Research and Development (R&D). However, taking into account what they have allocated to R&D, at some point in history they decided that the only outcome for industry was the international market. For this purpose they required the PCT, and they joined in the 90s.

The utilization is small compared to other countries, but the applicants who are developing medications, especially in the biochemical medicine industry, bio pharmacy and biotechnology, they use the PCT system a lot for international protection.

#### **Which are the lessons developing countries can learn from such “success stories”?**

In the first place, the necessity for promoting the patent system, for promoting its utilization and in that regard, to promote the use of the PCT. Especially at the innovation hubs such as universities, companies, etc. This is a very important lesson.

The subject of Intellectual Property (IP) in a general sense has not been relevant from the educational point of view. However, it is something of vital importance for the purposes of the protection and the success of developments of business and the economy.

In a globalized world it's very important to have tools for accessing foreign markets, and in this regard IP protection is a requirement.

From the point of view of trade, this is a virtually an indispensable requirement to be member of the PCT and that can be seen in all Free Trade Agreements (FTA) that are being signed. I always say that it is better to prepare and assume it, that being imposed.

Some way back I was talking with a member of a Colombian university, and she was telling me that in the international negotiations it's very important to have PCT patent applications. It's like an endorsement, that is to say, “I have an international application for this on this patent”. It shows seriousness and reputation.

It's necessary in our countries to let people know that this tool exists and they have it at their disposal, available to them as another commercial tool.

#### **Do you consider that the PCT has negative aspect that could be unfavorable to developing countries? How can they be addressed?**

If I'm not aware of what the tool is, what is it for, and how can I take advantage of it, it will be completely pointless to implement, and it will not foster development. This has to do with the training on this topic.

From a substantive point of view, the question of the PCT affecting national industries is going to depend, not on the PCT itself, but on the national patent legislation.

On the other hand, the access to information is also a very important topic which is not addressed enough in the trainings. This is the need to take into account the technical information

content patent documents for everything: for trade, for starting research projects, and so on. If this is not done, the PCT won't be beneficial.

But this is not the PCT which is negative, is the whole system. If I don't know how to use it for my advantage, logically others will surpass me.

**As argued by domestic pharmaceutical companies in Argentina, do you think that developing countries renounce sovereignty by joining the PCT?**

Absolutely not. This is addressed in an article of the PCT, substantive issues will always depend on the national law, they will always depend on the decision that each state adopts. This is a principle that is defended not only in the PCT but in other forums of patent law.

For the applicants of the world it would be much easier if they had an international patent, but the governments are not ready yet. The patent system has an impact on trade in general but also has an impact on very specific and very sensitive sectors of the economy, such as the sector of food and pharmaceuticals.

This way, all governments have reserved rights to continue to legislate about substantive contents on this matter, to be able to have freedom to establish national policies taking into account their circumstances. It's not the same a developed country to a developing country. Differences show in the legislative point of view.

The system is a system of cooperation between the states, and there is no renouncement of sovereignty. It's like other international treaties in which the states agree to cooperate on specific issues to facilitate the issue at the international level.

The same thing happens with the PCT. The only thing that is being facilitated is the access to the system. The effects of the system depend on national legislation.

**Do you believe that Industrial Property Offices in developing countries rely too strongly on the International Search Report (ISR) and Written Opinion (WO) prepared by international Offices?**

I won't say that they rely too strongly. Even if they did, this wouldn't be negative. One of the big problems that POs have at the moment is precisely the huge delays in patent examinations (patent backlogs). POs staff don't usually grow to the same extent as the number of patent applications grows. There is also an addition to the complexity of the applications.

It's curious because, if you see the Acts of the creation of the PCT on the 70s in Washington, governments complained about the same problems they are complaining now. The issues are lacking of examiners and lacking the ability to cope with increasing patents.

The ISRs and WOs are good. There are offices that have very little examination capacity and the ISR is a way of having at least a minimum criterion of examination. Offices that have certain examination capacity or a lot of capacity, and can afford to do a complete examination, they also use them because its ground already covered. This is to prevent redundant work.

The Patent Prosecution Highway (PPH) for accelerated patent concession also takes advantage of the results of the work by other offices precisely to avoid duplication of work and to solve the enormous problem of delays between the different POs. We are also trying to raise the quality of the patents.

The position of WIPO is definitely to use the ISRs to the possible extent, taking into account the special circumstances of each of the countries and the capabilities of each country,

**Which could be the arguments to convince industry sectors opposing Argentina joining the PCT?**

There are undeniable facts. A month ago, the 153<sup>rd</sup> country accessed the PCT. We are almost living in a PCT world. Argentina is the only one of the great economies of the G20 block that is not in the PCT.

I would suggest not listening to me, but either take a look around in the region. What's happening with the PCT?

These arguments that they will flood us with patents, that it will be impossible to conduct research, that's not exactly what is going to happen. I think that nothing is going to change for Argentina.

It's going to change a lot for the Argentine applicant, but for the Argentine patent system not so much. Maybe they will stop receiving applications via Paris Convention and PCT applications are going to increase, but in reality not any of these cataclysms that were announced will happen.

In fact, if we look at the current Argentine legislation, there are now expedite patent granting mechanisms and less strict than other countries. I believe they have now the Priority Patent Examination Program (PPEP) by which Argentinian applicants can get patents superfast.

In some way, the PO will have better quality of work because the patents are going to come better drafted and better complemented from a technical point of view.

Again, everything depends on the national patent law. The PCT can do damage or be beneficial to the extent that the national policy allows.

#### **Which measures or policies can governments implement to succeed in the transition to a PCT contracting state?**

The transition period is usually used by the offices to "tidy up the house" and to get ready for PCT. The preparation period is of a minimum of 12 months, and it's also utilized for preparing the examiners.

The new processes are not entirely new, it's only synchronizing the Paris Convention world with the PCT world.

Of course, and especially the transition period, it is very important to prepare potential applicants to make use of the system because the system that is designed to make life easier for applicants. If applicants do not make use of it, it's pointless.

#### **Which activities does the PCT Int. Coop. Division carry out in terms of PCT awareness and promotion?**

In WIPO we are considered to be a vertical cooperation division, in which we only deal with issues related to PCT. Notwithstanding, in our work we apply recommendations adopted by the member states within the framework of the program "Development Agenda". This program was adopted in 2007 and determines how cooperation activities should be organized.

One of the most important principles of the "Development Agenda", and that therefore governs our work, is that all request of cooperation activity must be oriented towards development enhancement. It must be on demand, that is, we do not do what they do not ask us to do. It must also be adapted to the needs of each country. Obviously it has to be transparent, and for this purpose there's a lot of information on WIPO webpage.

We organize all kinds of activities because considering that we have to adapt them to the demands, the specific needs and to the audiences. Typically we conduct seminars and workshops. We do very particular work with the POs to increase their training level. We also work with applicants, and also with IP Agents.

These days there are workshops going on between WIPO and the Inter-American Intellectual Property Association (ASIPI) in Paraguay, Brazil, Colombia and Mexico.

Beside these kinds of activities, we also organize study visits to WIPO and other offices to facilitate exchange of information. We conduct regional or sub regional seminars in order to facilitate the exchange of information between countries with similar characteristics.

We also have a technical assistance section for technical cooperation because one of the most important tools of the PCT is the possibility of doing everything in electronic format. We have specific software, called ePCT, and it allows the submission of applications in electronic format. We have a section that deals with the training of both the POs and the applicants in the use of the electronic tools for submitting applications.

The content of the seminars and workshops depends a lot on who has requested them, the degree of development, and so on. Usually we also invite lecturers from other countries, either from developed countries or developing countries, for them to show their experiences.

It's one thing to explain the PCT and another thing is to witness the PCT in real life. For this purpose is relevant to show foreign experiences.

We also have a section for the cooperation for examination training, on how to use all the tools available for examiners that are on the internet and that usually free of charge. The purpose is to increase the quality of the patents granted internationally.

We have a very flexible structure, considering that the needs vary greatly among requests. No seminar is equal to another. We do what we can with the resources and staff that we have.

#### **How can Universities raise awareness of the importance of accessing the PCT by Argentina?**

From what I've seen, it's not only about raising awareness about the PCT. You have to raise awareness about the patent system and about IP rights in a general sense at the universities. The best results I have seen in those universities that they integrate IP related topics in their curriculum. I believe the majority of universities include IP matters in careers related to Law.

But there's also a need for including IP matters in other careers, such as engineering. It's important for them to know how to deal with innovation processes from the start, and how to make innovation successful. For this purpose they need to know about IP.

Another issue that developed countries are good at is making a support structure for innovation within the Universities. These are the famous Technology Transfer Offices (TTOs). In a way, they help to identify innovation, the formulation of protection, is there's going to be a license, and so on. It's a very sophisticated world.

Universities should have an IP policy related to result protection and publishing. We were in the Caribbean discussing this issue and we saw that universities award the publications of scientific research but nevertheless they should give points for patent applications. They need resources, and patents are a great way to contribute in this regard through licenses and so on.

Another topic is the collaboration with Industry. Universities should be able to connect with companies not only when they have research results, but before they start planning the basic research. They should reach out for specific industry problems and have a certainty that the result will be patentable.

The objective is to "land" science in reality.